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Journal of the Society of Arts.

FRIDAY, DECEMBER 1, 1854.

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THIRD ORDINARY MEETING.

Wednesday, November 29, 1854.

The Third Ordinary Meeting of the One Hundred and First Session, was held on Wednesday, the 29th instant, William Hawes, Esq., in the chair.

The following Candidates were balloted for, and duly elected :—

Acworth, Rev. Dr.
Adams, John
Andrews, John
Barnes, Thomas, M.P.
Bath and Wells, Bishop of
Berger, Edward
Buxton, Charles
Cobbett, Arthur
Cockshaw, Albert
Corbett, John
Cornwell, James, Ph. D.
Cracknell, Edward Charles
Creed, Henry
Deane, John C.
Ferguson, William
Fitch, Joshua G., M.A.
Fogerty, William
Fowke, Capt. Francis, R.E.
Fraser, Sir Wm. Augustus, Bart., M.P.
Gray, John, M.D.
Grierson, J. B.
Hale, Rev. Edward
Harrison, Henry
Henderson, John
Hodgson, Kirkman Daniel
Hullah, John
Jones, Evan
Klein, William
Larnach, Donald
Mason, George
Moore, Robert R.R.
Murray, James
Neale, Robert
Oxley, John Timothy
Paul, Benjamin H.
Powell, Francis
Prowes, Rev. John Mervin
Sadler, Charles James
Scott, John B., M.A.
Spon, Francis Nicolas
Sykes, John
Symonds, John
Symons, Jelinger C.
Tartons, Charles
Van de Linde Monteuuis, Rev. G.
Waddilove, Alfred, D.C.L.
Waley, Jacob, M.A.
Watson, Thomas, M.D.
Wickham, Henry Wickham, M.P.
Willis, Henry Brittan
Wood, John
Wood, John
Wood, William
Woolley, Rev. Joseph, LL.D.

The first paper read was

ON SOME UNDEVELOPED AND UNAPPRECIATED ARTICLES OF RAW PRODUCE FROM DIFFERENT PARTS OF THE WORLD

By P. L. Simmonds.

The improvements in arts and sciences which are taking place day by day, the new manufactures which are starting up, the increase of population, the extension of colonisation, the greater demands made by manufacturers, and the continual waste occurring, are creating urgent wants for New Materials of Commerce, and a larger supply of old staples than are at present available. So bountiful is Nature, that the want has but to be expressed, and diligent investigation and inquiry set on foot, and the demand is soon satisfied. The student in his library, the scientific inquirer in his laboratory, the cultivator in his distant field of operations, the botanist and geographical explorer in their travels in distant lands, and the manufacturer in his workshop, testing and proving the value of some new commodity,—each and all of these may and do contribute more or less to the general good of mankind.

Each one may lend his aid, therefore, to add to the general stock of information,—to point out or suggest some pathway to discovery, some new unappreciated product, seemingly fitted for a particular purpose, or to direct attention to some neglected staple which was formerly useful, and has been latterly overlooked. I possess, probably, some facilities which have given me advantages over others in the investigation of Commercial Products, from having devoted my special attention for a considerable time to this peculiar object of study, both as a Colonial planter in former years and a literary investigator in a later period. Recently I have laid before the public, in a voluminous work, the extent of my researches into the history of the cultivation, manufacture, and consumption of some of the *principal* staple articles of Commerce, obtained from the Vegetable kingdom, but, from want of space, I was unable in that work to allude to a large number of *minor* products, and was obliged to pass unnoticed altogether the subject of vegetable fibres, of gums and resins, of timber and furniture woods, of fruits and vinous and fermented drinks, and a great variety of miscellaneous matters. In the preparation of a companion volume, on the Commercial Products of the Animal Kingdom, on which I have since been engaged, I have had my attention drawn to many articles which appeared to me deserving of special inquiry and scientific investigation, and some of these Undeveloped and Unappreciated Products of Commerce, at the solicitation of the Society of Arts, I desire now to bring under notice, in the earnest hope that out of the multitude of suggestions some one or other may possibly result in individual and general benefit to merchants, manufacturers, and the community at large.

An extensive correspondence with cultivators, producers, and scientific men in all parts of the world, has kept me perhaps better advised on new articles of Commerce than many other persons less favoured by circumstances.

The obligations of Commerce to Science are numerous, and the various nations of the earth are each helping on the progress of mankind towards greater comfort and towards general civilisation. The petty monarchs of Africa now find the trade in palm oil more profitable than that in human beings—the Zulu and Kaffir tribes, instead of waging exterminating wars with each other, are settling down more readily into the peaceful pursuits of stock-breeding and cultivating the soil; the fierce natives of Madagascar carry on a profitable cattle trade with the Mauritius and Bourbon. The islanders of the Pacific, by intercourse with missionaries and whalers, find a demand created for cocoa-nut oil, for shells, for sandal wood, for arrowroot, and other commodities, which bring them in valuable manufactured goods in return. The Malays and Dyaks of Borneo are stimulated to commercial pursuits by Rajah Brooke, and abandon, to a considerable extent, piracy and head-hunting, as less profitable than the disposal of gutta percha, antimony, and other staples. The skilled and industrious Chinese, driven by internal revolutions from their own country, carry their arts and intelligence to the Straits Settlements, to Australia, California, Central America, and the West Indies. The Coolies, after years of experience in planting and manufacturing sugar and coffee in Mauritius and Ceylon, return to India with improved ideas, and a large acquired stock of industry and knowledge for the advancement of their kindred. When we perceive the new and vast fields which are laid open to investigation and enterprise—the empires of China and Japan being no longer sealed countries—the interiors of the vast continents of Australia, Africa, and America, being ransacked by Commerce—the island groups of the Pacific and Eastern Archipelago, especially Borneo and New Caledonia, being now fast peopled by Europeans—who shall set a limit to the new and useful products which may be there developed and brought in to the aid of the merchant and manufacturer?

It has been well observed that the bounty of Nature is inexhaustible. The world went on a long time indifferently well without the potato—still longer without tea or coffee. There was a civilisation before the silkworm was discovered, or cotton produced to the extent it now is; and sugar, as a general article of consumption, is a modern improvement in diet. Nature, beyond doubt, has many wonders yet in her storehouses, awaiting the discoveries of man, and fitted for the rapid advancement of civilisation and common comforts. Each one (as I have already observed) in his own range of operations, adds to the general stock of improvement, and discovers something new, calculated to sustain and support man, and to benefit the progress of the world at large.

When we see how suddenly we have been drawn into hostilities with a powerful country, with which we had long maintained peaceful relations, and from whence we had derived valuable supplies of timber, tallow, hides, fibres, and other products of Commerce, we should consider the position in which our manufacturers might possibly be placed were a war to arise with the United States; from a stoppage of our supplies of that grand staple of our manufacturing trade—Cotton. In the last fifty years we have paid Russia one hundred and ten millions sterling for flax and hemp alone, exclusive of our purchases of grain, timber, and animal products, and probably we have paid her about six millions sterling per annum. Last year we received 41,819 tons of hemp from Russia, and 21,323 tons from other countries; and 64,400 tons of flax from Russia, against 29,770 tons from other parts. Surely, with a little attention and enterprise, these figures might easily be reversed in a year or two, and the whole or a greater quantity obtained from Ireland, and Canada, India, and other British possessions.

When we consider the changes of the seat of production in Sugar, and the variety of plants furnishing saccharine juices, we cannot say that there is no room for experiment here. For a long period the common sugar-cane was solely depended upon, but some varieties of this plant were soon found to be more productive than others; and countries in which the cane could not, from the nature of the climate, be raised, drew portions of their supplies of sugar from other plants. The sugar maple furnishes the home supply in British America and some parts of the States; the sugar beet furnishes about 160,000 tons to the Continent. In the East and in Africa, sugar is obtained from the palm tribe. In America it was found that the stalk of the maize furnished a good supply of saccharine juice; and very recently a friend of my own (Mr. Leonard Wray), who has had great experience in sugar planting in the East and West, and who has published an excellent work on the cultivation and manufacture of this valuable staple, has patented processes over England, Europe, and America, for producing sugar from another species of reed or cane, which, from its early maturity and suitability for cultivation in temperate climates, bids fair to work a complete revolution in sugar manufacture.

It is singular to watch the mutations that take place after a few years in the fields of production of various staples, and the rapidity with which they are transplanted to distant quarters, as local facilities of fresh soil, cheap land, labour, and colonisation are found to exist. The West Indies and British Guiana once produced large quantities of cotton, but the production there has almost ceased, and has been since taken up by the planters of the East Indies. The coffee of the West Indies, once a considerable item of production in Jamaica, Trinidad, Cuba, and Demerara, has now been almost monopolised by Ceylon and Java, and has also been taken up by Brazil. Ceylon now produces more than 22,000 tons. Sugar cultivation is declining in the west, and centring in the east, where the little island of Mauritius produces enormous crops, and the Indian presidencies and the Straits Settlements are fast increasing their cane plantations. The field of indigo culture has also changed from the west to the east. The geography of Commerce is a curious and interesting field of study. Gutta-percha has only come into use ten years, and yet it has become one of the most important products of Commerce for the purposes of Science and the arts. The extensive trade in cocoa-nut oil, palm oil, and nut oil is but of recent origin. The trade in pine-apples was started but a few years ago, and even our vast cotton trade from the United States dates but from the present generation, the man being now alive who shipped the first bale to Liverpool, which was reported on as unsaleable, and he was advised to ship no more; and yet the production of this article has risen to three million bales per annum in the United States, and we consume five thousand bales a day in this country! If by any sudden convulsion our supply of cotton from America should be cut off, how wide-spread would be the resulting destitution and ruin to many of our merchants and importers and to a large class of the population in the manufacturing districts. And yet we have every facility of soil and climate for producing in our own dependencies of Africa, India, and Australia, more than sufficient for our wants.

Notwithstanding the occasional failure of our potato crop from disease, arising in a great measure from degeneracy, we have done little towards renovating the stock or experimentalizing on new tuberous roots, and yet there is a large field open. Now and then we hear of one or two trials by the French and others, but they are seldom followed up or persevered in. Many potato-like plants, producing edible tubers, exist in Peru, Mexico, and other parts of America, approaching very near to the common species, and only requiring culture to enlarge or improve them. There is the mendo, or wild sweet potato, and the crane and prairie potatoes of the North American Indians, the saa-ga-ban and musquash of the Mic Mac Indians of Nova Scotia and New Brunswick, the oca and milloco of Peru, the *Lathyrus tuberosus*, and many fine species of yams, which might be naturalised. How little, also, has yet been done in the foreign commerce of feculas and starches, so largely used in the arts, as well as for articles of diet, and for which, therefore, a considerable demand exists in England. Within the last year or two arrowroot and sago have figured more largely in our returns of imports, but their production is unlimited and of a most remunerative character, besides being attended with little expense in the manufacture.

Attention has recently been prominently directed to the means of procuring *supplies of vegetable fibre* as a substitute for hemp in the preparation of cloth and cordage, and for rags in the manufacture of paper. Population increases so rapidly that the demands for linen and cotton clothing, as wealth and civilisation progress, become most extensive, and the destructive waste is yearly very considerable. The demand for sails and cordage for the immense mercantile fleets of the different maritime nations is also considerable, besides the demand for sacking and bales, nets, &c. The consumption of paper for the general purposes of literature is so enormous that the ravenous maw of the printing press has, in many quarters, produced a scarcity of material bordering on famine. The subject of fibres was recently so ably and fully discussed before your Society, by Dr. Royle, that any further observations are scarcely called for.

I will, however, briefly allude to one or two substances which may, probably, be new. I believe there is no part of the world which produces so many plants capable of yielding serviceable fibre as the Indian Archipelago, including the Malay peninsula. The bark of several trees, such as the baru-baru—a species of Hibiscus—is used by the Malays for cordage, and the fibres of many smaller plants are applied to the same purpose. A correspondent of my own (Mr. W. C. Oondatje), an excellent botanist, in the interior of Ceylon, has called my attention to very many suitable plants indigenous to that island.

The Malay sempstress finds, in the plantain stem that grows beside her hut, an excellent and unlimited supply of thread. It is this last article that appears best adapted for an immediate supply of fibre in quantities sufficient to make it an important article of import to this country—for it possesses all the essential requisites of abundance, cheapness, and suitability.

There are numerous varieties of tropical and other plants whose barks and fibres are admirably adapted to supply not only the place of flax and hemp, but to form good and cheap substitutes for silk.

Manilla hemp and pita, the common pinguin, the Agave or American aloe, the anana or pine-apple fibre, and Bromelias, Indian hemp, jute, plantain fibre, the ochro, mahoe and other species of Hibiscus, the trumpet-tree or snake-wood, various specimens of Resteo in the Cape Colony; the Rheea and plants producing the China-grass cloth, New Zealand flax, and many others, furnish valuable materials applicable to our various textile manufactures, for paper-pulp and cordage. They can all be obtained in our colonies and dependencies, and can be imported so as to yield a large profit both to the producer and the home manufacturer, and yet at a price that will advantageously compete with hemp and flax.

Dr. Hunter, of Madras, has recently taken a very active interest in promoting the preparation of fibres of the plantain, aloe, pine apple, marool, and yucca. Within the last few years he has devoted special attention to experiments in the preparation of fibres of different plants as substitutes for flax. A flax dresser has pronounced the fibres of the marool to be superior to any flax, and the plantain fibre he sent home prepared, was stated to be worth 70*l.* per ton. He is having many of the indigenous fibres of the Madras presidency prepared with great care for use in imitation of silk, or fine linen, to sew ladies' collars, and for crotchet work, for which it is suited, as also for the manufacture of ornamental braid for lining carriages. It is a very silky material, of considerable strength, and far too valuable for the manufacture of string or tow, which was the first use it was put to. It takes dyes beautifully, and is much improved in appearance by attention to one or two little parts of the process of preparation.

The valuable qualities of the plantain fibre for the manufacture of several descriptions of textile fabrics for which flax, hemp, and even silk are now used, as well as cordage and paper, have led to many experiments in the construction of a suitable machine by which the fibre could be prepared in the most simple, cheap, and expeditious manner. These, hitherto, have always failed when brought into operation, owing partly to the peculiar nature of the substance to be acted upon, and partly to ignorance respecting its nature and qualities. The Hon. Francis Burke, the puisne judge of Montserrat, who has been conducting experiments for several years, has at last completed a small machine which perfectly cleans the fibre, and leaves a beautiful white, silky substance, resembling flax, only that it is three times the length of flax, capable of being manufactured into any description of textile fabric, from the finest cambric to the coarsest sail-cloth.

Persons who have witnessed the operations of the machine in the colony, declare that its simplicity of action, the ease with which it can be worked, the impossibility of its going wrong and injuring the fibre, and its extreme cheapness are surprising. A piece of the stem of the plant is held by one end in the hand, passed into the machine through the feeder, and being still retained in the hand, is drawn out again perfectly clean and white. It can be worked either by hand or any other motive power, according to size. A small hand machine, which will cost little over three guineas (irrespective of any patent right), will, with the assistance of a mere child to feed it, clean about 150 lbs. per day—and it is so portable (being contained in a box about 18 inches square), that it can be taken to the spot where the plantains grow; they may be cut down, prepared, and the fibre carried home in the evening ready for shipment.

The machine can be made on any scale—large enough to clean a ton a day if requisite. So small is the waste, that from 75 to 80 per cent. by weight of prepared fibre is procured from the plant, irrespective of its watery particles. And the waste substance, which comes from the interstices between the fibres, is a valuable pulp that requires only to be washed to fit it for manufacture into the finest writing paper. The pulp alone, it is estimated, will pay the cost of working, and the fibre produced will therefore be nett profit.

Mr. J. B. Sharp, a very intelligent gentleman on all that relates to fibrous products, has also recently patented important improvements in machinery, and is about to enter largely into the cultivation of the plantain in Jamaica, Demerara, and Montserrat, for the manufacture of fibres on the spot.

We know little of the available fibres of the vast valley of the Amazon, now laid open to commerce by steamers running from Brazil to Peru and the various tributary streams. We know nothing of the character of the thistles which form the chief vegetation of large districts of the Pampas of South America. We know nothing of the nature of the prairie grasses and reeds of North America, and we know little of the indigenous products of the fertile countries round the various states of Central Africa, recently discovered by Livingston, Overweg, and other African travellers. And why are we ignorant of the nature and value of all these products, so important to be ascertained? Because we have no City Trade Museum, no central repository for every raw product of nature in her several kingdoms. For this desideratum I have agitated and laboured assiduously; for this I have endeavoured to move public opinion by the press; * for this I have held an extensive correspondence with energetic and scientific men in various parts of the world; for this I have had interviews with Lord Mayors, civic functionaries, brokers, and merchants, most of whom have pooh-poohed the matter, and started frivolous objections, pointing to the British Museum, and the museums at Kew and at the India House as amply sufficient for the purpose. Glad, therefore, am I to find that this Society is slowly but steadily progressing in its exertions to establish a Trade Museum which shall be a credit to the nation, and the benefits of which to science and the arts it is impossible to overrate. I regretted, however, to notice that the valuable collection remaining over from the Great Exhibition of 1851 was being scattered through the country in gifts to provincial museums.

From the kittool or jaggery palm (*Caryota urens*) a very strong black fibre, like horse-hair, is obtained, about a yard long, which is made into ropes by the Singhalese for tying wild elephants and buffaloes. It is more durable in water than coir, and is well adapted for making brushes, baskets, caps, and other purposes for which horse-hair and bristles are used, and to which it is now being applied in this country.

The Nehinda plant of Ceylon (*Zanseviera zeylanica*) is well adapted to textile uses, possessing a long, white, silky, strong, and excellent fibre, equal to flax. Good paper might be manufactured from it.

The Muddar (*Calotropis gigantea*) has a very strong, short, silky fibre; the marsh-mallow, a longer and finer fibre, but deficient in strength—paper has been manufactured from this fibre. The inner bark of the Ceylon sack tree comes off entire, like a woven fabric, and is made into sacks, which are very durable; it might be used for making strong paper. The *Gnidia eriocephala* furnishes a very suitable fibre for paper manufacture. The natives of Ceylon make bagging with the inner bark. The *Ficus papyrifera*, as its specific name implies, is used by the Kandyans for manufacturing paper. One of my correspondents at Ceylon writes me, by the mail just arrived, that he has lately met there with a species of nettle allied to the China grass plant, and he is preparing some fibre therefrom, of which he proposes sending me a specimen.

Gums of different kinds enter largely into our commercial transactions, coming chiefly from Asia and Africa. Morocco, Alexandria, and the Arab coasts of the Red Sea are great gum marts. Our imports exceed 50,0000 cwt. per annum; about 30,000 cwts. are annually shipped from Indian ports—these are classified chiefly into gum-arabic, gum-senegal, gum-tragacanth, and copal and animi, which are resins, the classification or proper distinction being little attended to by shippers or importers. Besides the above, there is about 30,000 to 40,000 cwts. of lac dye and schellac imported from India.

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* *Vide* leading articles in the *Journal of Commerce*, May 13, 1854, and in the *Globe*.

In Morocco, about the middle of December the gum harvest commences, and the Arabs encamp on the borders of the forests to collect the gum from the various species of acacia-tree. It is packed in very large sacks of leather, and brought on the backs of bullocks and camels to certain ports, where it is sold to the French and English merchants. It is highly nutritious. During the whole time of harvest, of the journey, and of the fair, the Moors of the desert live almost entirely upon it; and experience proves that six ounces of gum are sufficient for the support of a man twenty-four hours.

It is stated that in the year 1750 one of the large Abyssinian caravans, having consumed all their provisions in the desert, when still two months' journey from Cairo, were obliged to support themselves solely on this gum, and thus above one thousand souls were preserved from death.

In Australia and the Cape Colony, where numberless species of acacia abound, a considerable quantity of gum might be collected.

A large trade in gums is carried on by Bombay merchants with the Somallies inhabiting the north-east point of Africa, who ship considerable quantities annually to the Red Sea and Indian markets, the average shipment in the season being about 1000 tons. Frankincense and myrrh are also obtained in Arabia Felix, about the shores of the Red Sea, and the Persian Gulf. One of the gum trees of Popayan, in South America, yields a resin so remarkably tenacious that when used to varnish ornamental work it resists the application of boiling water or even acids.

A wood oil, known as gurgun in the Indian bazaars, is obtained from a species of *Dipterocarpus* (*D. laevis*), which is of the consistence of honey. It has an odour like balsam of copaiba, and contains a principle analogous to that balsam, for which it is an efficacious substitute. The well-known gingilie oil is a good substitute for olive oil. A nearly colourless oil, obtained from the Ceylon oak, might be used as a drying oil; it is said to be a good remedy for the itch. An empyreumatic liquid resin, or wood oil, is obtained from the *Sethia indica*, and it is applied, like tar, to boats and canoes,' as a preservative of the wood. It is much used in Southern India. The *Litsea sebeifera* furnishes a solid, pungent, and aromatic oil, like cubebs, which is fit for making candles. Kekune and Illepi oils yield inferior lamp oils. The latter, from the *Bassia latifolia*, forms an ingredient in the manufacture of Indian soap. From the Ceylon gamboge a fatty oil is obtained, soluble in turpentine, producing a golden yellow fluid. It is obtained in the proportion of 79 per cent., and is used by the Singhalese for culinary purposes. Cinnamon suet furnishes a solid aromatic oil, which is made into candles, used as lamp oil, and in cookery by the natives of Ceylon, and might probably be used in the manufacture of scented soap.

The *Semecarpus obovatum* furnishes abundantly a superior black varnish, equal to that of China or Japan, mixed with Vateria resin. It is soluble in turpentine, and free from acidity. The East Indian copal, from the *Vateria indica*, is very like the gum animi of our shops, is soluble in turpentine, and a very useful varnish for furniture and pictures. The wild nutmeg tree of the East produces a kind of dragon's blood; the red juice, which dries in transparent brittle flakes, might also be used as a beautiful varnish.

The extension of the electric telegraph wires over various seas and lands renders an available supply of gutta percha of the utmost value just now, and the discovery of new and abundant sources of this very important staple would develop a wide field for commerce.

There are no less than twenty-two plants already registered as productive of this resinous gum in India, mostly of the fig and Euphorbia tribes, and the Indian government have, I understand, engaged the services of a gentleman formerly employed as chemical examiner and analyist to the Gutta Percha Company, to examine into all the indigenous substitutes for this valuable gum. Many hundred maunds of the India rubber gum are obtained in the forests of Chardwan, in Assam, from the *Ficus elastica*, which extends over 10,000 square miles. *Urceola elastica*, a large creeper abounding in the Indian Archipelago, is another source of supply. The tree which yields it in Brazil is the *Siphonia elastica*. The imports of caoutchouc have gradually increased within the last five years, from 4,000 cwt. to 20,000 cwt.

All the milk-yielding plants furnish substances likely to prove of commercial value, especially the very common *Cactus cereus*. The various plants of the fig tribe will all yield a kind of gutta percha. The product varies, but that from the *Ficus Indica*, which is the best, is perfectly firm and hard, of a reddish-brown colour, and very plastic.

The *Euphorbia cattamundos*, and another species—plants which are common in India—supply a gum very analogous to gutta percha. The juice or sap of the muddar tree is also firm and white, and capable of answering any purpose to which gutta percha can be applied. The inspissated juices of the jack fruit, and the wild and cultivated bread fruit trees (*Artocarpus*), and the Lola tree of Ceylon, yield substances which could be used as substitutes for caoutchouc or gutta percha. The great question, however, to be decided is that of cost—namely, the producing price of the article. The true gutta percha ranges here just now from 1s. to 1s. 6d. per pound. The newspapers of Sinde speak of the gutta thoor, which, it is said, with care and attention, might be made to rival gutta percha.

The India rubber tree grows in great abundance in some parts of the province of Chiriqui, Costa Rica, and yet, notwithstanding its convenient locality near the Isthmus, and the great demand for the product both in the United States and Europe, little or nothing has been done to bring it into notice, or to make it available.

In Ceylon resinous gums could be obtained from the *Calophyllum Inophyllum*, the *Hebradendron Cambogoides*, the *Ficus politoria* and *Stalagmitis tinctorius*.

The *Asclepia gigantea*, which is common in Jamaica and many of the West India islands, abounds with a milky juice, which, as it gradually dries, becomes tough and hard, like gutta percha. It also produces an excellent fibre, useful in the place of hemp and flax, and the poorest land suffices for its growth.

Gutta percha has been discovered in the British province of Mergui; it is not precisely identical with the gutta percha of commerce, but it possesses all the valuable properties of that substance, including plasticity in hot water, and the power of insulating electric currents.

The *demand for vegetable oils* is largely on the increase, as our supplies of animal oils and fatty substances are declining. For food, for illuminating purposes, for lubricating machinery, for making soap and candles, and for the woollen manufactures, the consumption is now very considerable, and although supplies are derived from many new sources, yet there is no limit to the quantity to be obtained; and the animal and vegetable kingdoms can yet be laid largely under contribution for the wants of mankind. Leaving out of consideration here the well-known oils of commerce—cocoa-nut oil, palm oil, olive oil, and earth-nut oil—beginning with the castor oil, so useful for burning and as a medicine, and ending with the moringa, which serves to the distiller as a medium for extracting and preserving the perfume of flowers, the list of oil plants is innumerable. The oil or butter of the cacao seed is a production the surpassing qualities of which only require to be made known in Europe to supersede many other productions of the sort.

The stoppage of supplies of tallow from Russia has led to experiments on, and enquiries for, other materials. Mr.

Wilson, of the Belmont Works, Vauxhall, has patented certain improvements in treating a new vegetable tallow from Borneo, and nutmeg butter by powerful acids, and fitting the product for the manufacture of candles. And a patent has been taken out by a Liverpool merchant for making soap by means of tallow extracted from materials hitherto considered nearly worthless, and which can be obtained at one-sixth of the price paid for Russian tallow. The wax obtained from the berries of the candle berry myrtle is now occupying considerable attention at the Cape of Good Hope, where it can be obtained very cheap, and in large quantities. Varieties of the shrub abound in Carolina, New Brunswick, and other parts of North America, and in the Bahamas, and I recently directed attention to its cultivation and the manufacture of its product in the *Pharmaceutical Journal* (vol. xiii. p. 418).

A very large white pea is grown near Shanghae, in China, from which oil is extracted for burning; and the refuse is then made into a large cake, pressure being used to cause all the moisture to exude; this cake is used for manure, and for feeding cattle and swine. So extensively is this article used, and so great is the consumption, that the late Mr. Thom, then one of her Majesty's consuls, stated that from Shanghae alone 10 million dollars' worth is sent or distributed over China. This leguminous plant is called Teuss, and the marc or cake, tan-ping. Dr. Robert T. Thomson calls attention to another extensively used Chinese oil, named tea-oil, said to be produced from the seeds of species of the two genera *Thea* and *Camellia*, which oil is nearly unknown in Europe. It is, when fresh, quite free of smell, of a pale yellow tint, without any sediment when long kept. It resists a cold of 40° Fahr. Its density is 927. It is insoluble in alcohol; sparingly soluble in ether. It burns with a remarkably clear white flame. This oil might prove an important article of commerce in the East, because in its properties it is superior to cocoa-nut oil, and the various other oils prevalently used for burning, or as oleaginous condiments in Asiatic countries.

From the leaves of the Australian Eucalypti an oil can be procured of equal utility to the cajeput oil of the East. The Sandarac exuding from the Callitris or pine tree, the balsamic resin of the grass trees, and moreover the Eucalyptus gum, which could be gathered in boundless quantities in Australia, and which, for its astringent qualities, might at least supersede the use of kino or catechu, will probably, at a future period, form articles of import.

The products of the forests of the globe are very numerous, and have conferred inestimable blessings on the people; and yet how many of these products are as yet unknown and unappreciated. True we obtain from them timber for various building purposes, for turners' use and marquetry; fire-wood, charcoal, ashes, tanning and dye-woods, medicinal barks, nuts and seeds, grasses and reeds for mats.

The imports and consumption of foreign and colonial timber last year amounted to 2,276,000 loads, besides 111,003 loads of staves. To the forests we are further indebted for many adhesive and resinous gums, for our dietetic drinks, tea, coffee, and cocoa, for most of our species of oils and drugs, for the naval stores of tar, pitch, and turpentine, for lacs and varnishes, for many fibres and a host of other useful staples. Careful investigation by scientific enquirers, each in his particular locality, will yet bring to light much that is new—much that was heretofore unknown or overlooked in this department of commerce.

The collection of ornamental useful timber is inexhaustible, and hundreds of these might be applied to a thousand different purposes in many important branches of European industry. The list of woods is a voluminous one, with special peculiarities in each locality.

The guiacum, the logwood, the mammy sapota, the green-heart, the manchieneel, and many others would be found of high worth to the cabinet-maker.

I would call attention especially to the Catalpa, a beautiful tree, which has the twofold advantage of furnishing an excellent wood for household furniture and yielding a natural dye from the seeds, in which the tree abounds far more than in leaves.

I have before me a carefully-prepared list of nearly 100 of the timber trees of Ceylon, with their separate uses, and the variety of purposes to which they can be applied, prepared by Mr. Mendis, master-carpenter of the Royal Engineers Department in that island. And this is but a small portion of the forest vegetation of that beautiful island. My friend, Mr. John Capper, catalogued 416 varieties, and then admitted there might have been others which had not come under his notice.

The variegated or flowered satin-wood, most valuable for furniture, and the Jack tree, when well-selected and polished, very frequently equal good mahogany. The heart of the bastard ebony is occasionally met with of extraordinary beauty. Central America, the West India Islands, India, and the Eastern Archipelago, Australia, Van Diemen's Land, and New Zealand, are all rich in woods of various kinds, on which our merchants have yet drawn but slightly.

This is a most neglected department of commerce, and we greatly require special and general information in this extensive field. A spirit of investigation is on foot, which I trust will contribute shortly to this desired end. The Australian Society of Sydney recently offered its large gold medal for the best treatise on the woods of New South Wales and the adjacent colonies and islands, setting forth their localities and botanical description, and accompanied by specimens in their natural, manufactured, or polished state. Mr. Balfour, in charge of the Government Central Museum at Madras, has recently set on foot inquiries to enable him to draw up a report and description of the forests and woods of Southern India.

It is impossible to overrate the importance of the timber trade to a maritime and manufacturing country like Great Britain, and fortunately we are rendered thoroughly independent of foreign supplies by the immense quantities to be obtained in our North American provinces, India, and other British possessions.

Attention has recently been directed to the propagation in some of our colonies of the African argan tree, (*Argania sideroxylon*), which is especially recommended for Australia and some parts of the Cape Colony, subject to drought. The kernels of the nut yield by expression a considerable quantity of oil, and the husks are greedily eaten by cattle. The wood, which is close and hard, is also useful for many domestic purposes. The tree bears fruit at from three to five years in Morocco.

The exchange of new and valuable plants is going on from time to time, and is likely to be attended with very beneficial results; the Guinea grass of the West Indies has been transplanted to Bermuda and other quarters, where it is highly valued for fodder; and the Tussac grass of the Falkland islands has been carried to many parts of America and to Scotland.

Thus Dr. Mueller, the Government botanist of Victoria, in his official report made at the close of last year, after a journey of several months into the interior, among other things pointed out that *Anistome glacialis*, a large-rooted umbelliferous plant, from the snowy top of Mount Buller, might be added with advantage to the culinary vegetables of the colder climates, and that the root of *Scorzonera Lawrencii*, a favourite food of the natives, would form, if enlarged by culture, an agreeable substitute for asparagus. The bark of *Tasmania aromatica* he also found to possess the medicinal properties of the Winter bark.

Such apparently unimportant things as rattans, malacca canes, cork, bast-matting, basket-work, straw plait, and palm leaves for hats and bonnets, form large items in our imports, and give extensive employment to industry. The value of the mats and matting we receive principally from Russia is about £40,000 per annum; of basket-work, chiefly from France, and chip and straw plait, each about the same amount; corks, ready made, some £19,000 to £20,000.

Among the miscellaneous articles of industry in our colonies are mattrasses made from the husks of the Indian corn, from mosses, the down of the silk cotton tree; and there are also a variety of grasses admirably fitted for the purpose. A useful material was also, not long ago, brought into notice, originating in Prussia, being a kind of wool or cotton prepared from the leaves of the coniferous trees, and termed pine wool, which could be spun and twisted into carpets, horse-cloths, coverlets, &c.

A new kind of stuffing for sofas, beds, &c., was recently introduced into Sydney from Java. It is said to be a vegetable fibre produced by some grass, and resembles extremely fine cotton, except that it is more silky in appearance. It is stated to possess the very valuable qualities of never felting or getting into lumps, like common flocks; that it will not harbour any insects; and that it is not retentive of moisture. If, on future experiment, it is found to possess these qualities, it must prove a most valuable article of commerce, especially when the high price of horsehair and feathers is taken into consideration. A great amount of ingenuity has been expended to provide substitutes for these costly materials. Cocoanut fibre, cork shavings, steel springs—a peculiar black moss, that is gathered on the coast of Mexico, have all been tried with various success, but none of these would be able to compete with this new material, if it is procurable in any abundance and at a low price. This is probably the stuff obtained at the Feejee Islands, under the name of Ballambala.

The ordinary sugar packages of Mauritius and Bourbon are made of the leaves of the vacona palm.

The Ceylon moss (*Gracelaria lichenoides*) is very abundant on the lakes and shores of Ceylon, and is much used as a valuable vegetable jelly. It contains a large proportion of true starch.

Agar-agar, (probably the *Fucus tenax*,) is shipped from the settlements of the Straits of Singapore to the Chinese markets, to the extent of several thousand tons, being much used as a size for stiffening silks, and for making jellies. Iceland moss, carrageen or Irish rock moss, and other fuci, might enter more largely into commerce than they already do. Iodine, the orchil dye, seaweed for manure, and other preparations, attest the value of the marine vegetation, on which as yet but a small degree of attention has been bestowed.

The protracted civil war in China bids fair to restrict the cultivation and manufacture of tea, and to lessen the supplies for European commerce. Is it not, therefore, highly desirable to promote the culture of the plant in suitable localities, particularly those where Chinese labour and experience are readily available? Its culture and manufacture have been successfully prosecuted in India, Java, and Brazil; and the tea-plant has been introduced into Madeira, the United States, and California. Natal and Australia seem also to offer suitable localities.

How much remains to be done in the production of wines, brandy, cider, vinegar, shrub, cordials, essences, and liqueurs of all kinds from tropical juices and fruits. Aromatic wines, with lasting bouquets, might be used in abundance. Look at the fruits, with their luscious flavour, which are wasted; the pommerose, the pineapple, the guava, the mango, mammy-apple, limes, and oranges; whilst granadilla flowers, orange flowers, and the vanilla are there for perfume. Peach brandy is largely manufactured in the United States.

In twenty-four hours vinegar may be made from numerous tropical juices in abundance.

The production of alcohol might be greatly extended, if necessary. Rice, jaggery, and the palm juice, or toddy, in India, and the pulp of the beet-root, could be extensively applied to the production of spirit, which is largely in request for various tinctures, preserves, spirit-lamps, ether, in the chemical and pharmaceutical laboratories, for dissolving gums, preserving objects of natural history, and other purposes.

An excellent cider beverage may be obtained from the juice of the pine apple by fermentation. Old Ligon, the early historian of Barbados, writing two centuries ago, speaks in raptures of it: "The last and best sort of drink that this island or the world affords, is (says he) the incomparable wine of pines; and is certainly the nectar which the gods drinke, for on earth there is none like it; and that is made of the pine juyce of the fruite itself, without commixture of water or any other creature, having in itself a natural compound of all tastes excellent that the world can yield. This drink (he adds) is too pure to keep long; in three or four days it will be fine; 'tis made by pressing the fruit and strayning the liquor, and it is kept in bottles."

In Mexico, a most nourishing and refreshing beverage, known as *tepache*, is compounded of pine apple juice, parched corn, and sugar.

How little attention has been paid to the trade in succades. Sweetmeats and jellies, which by their lusciousness, purity, whiteness, and clearness, might surpass anything produced in Europe, could be sent from our colonies in large quantities at a most cheap rate. A new era ought to be opened up in confectionary from the West Indies—an art which seems to have been intended in particular for islands producing in luxurious abundance sugar and all the rich and palatable fruits susceptible of preparation—the pine apple, guava, mango, tamarinds, bananas, &c. Bordeaux, Marseilles, Spain, and Greece, have, be it remembered, established an immense trade for their dried fruits, and with sugar obtained at second hand. The manner in which a large trade in fruit can profitably be carried on, is shown in the commerce in oranges from the Azores and Portugal, in grapes, melons, peaches, and other delicate fruit from the continent, and in pine apples from the Bahamas and Coast of Africa. Dried fruits of various kinds might be experimentally tried from the colonies, and the Society of Arts has repeatedly endeavoured to stimulate colonists to experiments in this line.

How rich are many localities in *medicinal plants*, the useful properties of which are well known to the natives. Central and South America particularly abound in these, and Mr. Berthold Seeman, in his Flora of Panama, has recently given a long list of new ones worth trial by our pharmaceutists, which are recommended as febrifuges, purgatives, tonics, emetics, vulneraries, anti-syphilitics, antidotes, &c. The soil of tropical countries is almost overrun with those plants famous for different virtues. My correspondent in Ceylon writes me last mail: "I have lately been using the snake gourd *Trichosanthes palmata* and *T. cucumerina*, with much success as a febrifuge. I shall be glad to send you some of this herb together with my notes and remarks on it. I have just begun to subject to direct chemical experiment the indigenous plants of this island, with a view to ascertain their therapeutic effects."

By all civilised and commercial nations the *products of the sea* have been accounted fully as important as those of the land; because they not only afford cheap, nutritious, and abundant food to the people, but contribute largely, moreover, to the national resources, and to the maintenance of a maritime ascendancy. What a rich and inexhaustible source of wealth our home and colonial fisheries could be made if more generally engaged in, and conducted and managed on a proper system. Twelve years ago I called attention, in the "Colonial Magazine"* to the value of our colonial fisheries, and subsequently frequently returned to the subject.

A rapid glance at a few products of the fisheries may be possible. The United States have about 2500 vessels and boats, aggregating nearly 150,000 tons, employed in the cod and mackerel fisheries, and the value of their catch of fish exceeds one million sterling. The value of our North American fisheries is well known. On the coast of Scotland about 15,000 fishing boats, manned by 62,000 men are employed, and the catch of herrings on our coasts last year was very large, amounting to 908,801 barrels. Sixteen and a half million of herrings were also caught by the Dutch on their coasts last season. The catch of pilchards in the West of England averages about 24,000 hhds. in the season; and the pilchard being one of the fattest of fish, the oil obtained is a very valuable product of the fishery. The French pilchard fishery of the Loire gives employment to 3000 fishermen on the water, and a great many persons on shore in curing the fish. The coarse and impure kinds of fish oil are much used by fullers and curriers in the leather manufactures of Holland and the North of Germany, and are supposed to possess the power of dissolving and removing the gelatinous matter of the hide. Besides clarified lard oil the principal animal oils are whale and porpoise oil, and various fish oils. We all know the enhanced value which has been given to cod liver oil by its extensive prescription in cases of rheumatism, scrofula, and consumption. The oil is not procurable alone from the liver of the cod, but is obtainable in smaller quantities from the ling, the dorse, the torsk, the coal fish, the skate, the ray, and many other species of white fish, some of which, or individuals allied to them in genus and conformation, are to be found on almost every sea coast in the world. About one hogshead of fish oil is obtained from every hundred quintals of cod.

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* "Fisher's Colonial Magazine," vol. ii. pp. 89, 291; "Simmond's Colonial Magazine," vol. vi. p. 51; vol. ix, pp. 105, 471.

The application of steam to the extraction of oil from seal blubber would both increase the quantity and improve the quality. The present plan is to extract it, partly by compression, and then to boil down the blubber in large pans or cauldrons, by which much is wasted by volatilisation, and the rest deteriorated by becoming carbonised, or browned. The export of fish oils from Newfoundland averages nearly three million gallons.

The dugong or yungun—the sea-pig, as it is popularly called—is spoken of favourably in Australia for its commercial products. It yields a large quantity of remarkably pure, clear oil, about five or six gallons from each animal, and in fineness and hardness of grain, and specific gravity and appearance, its bone approaches nearly to the nature of ivory. It could be used as a substitute for that material for most of its purposes, and might be procured at Moreton Bay, Port Phillip, and other quarters, in considerable quantities for export. The blacks are very expert in harpooning them, and they are passionately fond of the flesh, preferring it to any other kind of food.

Sharks of several kinds are abundant in all tropical harbours, in the mouths of the larger streams, and in the adjacent ocean. Residents on or near the coast procure a good serviceable oil for their lamps from the fat and liver of the shark, but this oil has a most disagreeable smell, which, however, might be got rid of.

The liver of a large shark, twenty-eight feet long, and eighteen feet girth, recently caught on the American coast, filled ten barrels, and furnished a large quantity of valuable oil. The hunting of these ravenous sea-wolves has become quite an exciting and manly sport in many quarters, and is enthusiastically followed up. The fins, which fetch a good price in the China market, can be procured at a very moderate rate in New Zealand and the Indian Presidencies. One of the largest sharks I have seen mentioned was caught in Burmah in March last. It got stranded on a shoal, from which it could not extricate itself, and forty boatmen plunging into the water, attacked it with spears and other offensive weapons, and at length conquered it. The creature measured thirty-five feet, and afforded, by very imperfect cutting, 365 pounds of solid flesh, which the men dried, and took to Rangoon.

Dr. Buist, in a communication to the Zoological Society in 1851, stated that there were thirteen large boats with twelve men in each constantly employed in the shark fishery at Kurrachee. The value of the fins sent to market varied from 1,500*l.* to 1,800*l.*. One boat will sometimes take at a draught as many as 100 sharks of different sizes. The average capture of each boat probably amounts to about 3,000, so as to give the whole sharks killed at that one station, as not less than 40,000 a year. The Mhor, or great basking shark, which is frequently forty to sixty feet in length, has to be harpooned.

The back fins, the only ones used, are cut from the fish and dried on the sands in the sun; the flesh is cut off in long strips and salted for food, the liver is taken out and boiled down for oil, and the head, bones, and intestines, left on the shore to rot, or thrown into the sea, where numberless little sharks are on the watch to eat up the remains of their kindred. About twenty-six cwt. of fish maws, besides sharks' fins, are annually exported from Penang to China.

The dogfish is peculiarly rich in oil and very plentiful, and porpoise oil fetches a higher price than seal oil.

Then again we have in India the Pulla fish; surely something might be made of the rich oil which abounds in it.

In the Pacific a trade has sprung up at the Gallipagos and other islands in dried fish, which finds a ready sale at the ports of the continent. The fish is a species of rock cod, averaging about seven or eight pounds, exceedingly sweet and well flavoured, but different from the species of the same name in the Atlantic, being much shorter, but more fleshy.

Flounders are dried at Siam, and exported to all the eastern ports. There is also procured the best balachong, a composition of dried shrimps, pepper, salt, and seaweed, &c., beaten together to the consistency of a tough paste, then packed in jars for use and importation. It is much sought after by the Malays, but to an European palate is not very pleasing. About 500 tons of dried fish, principally from the independent states of Hindostan and the Maldive Islands, is imported into Ceylon for local consumption, and about 50 tons of trepang or beche de mer, the well-known esculent sea-slug, is supplied from Ceylon, annually, to China.

It strikes me that many fish might be dried and reduced to powder, as the larger conger eels are done which are shipped from Mount's Bay and the Devonshire coasts, and exported largely to Spain and Portugal, where this powder is used for enriching soup. Several savage nations possess the art of preparing fish in a great variety of ways even as a kind of flour, bread, &c. The modes of preserving fish are various; they are salted and dried, smoked and potted, baked or marinaded, preserved in oil, and pounded into a dry mass. Fish maws and sharks' fins are esteemed great delicacies by the Chinese, and form the chief ingredient of their mock-turtle soup. Dried shrimps are an extensive article of commerce in the Philippine Islands and the Eastern Seas. Some dried mullet were shown at the Great Exhibition from New Zealand, cured for the China market, which were sound, but not high-flavoured.

The cow-fish is a species of Manatus, found on the rivers and lakes of the Amazon valley, is killed by the natives for its oil, from 5 to 25 gallons being obtained from each, and the flesh is also eaten.

In many quarters turtle are found in large numbers. On the coasts and rivers of South America and in the Indian Archipelago they are very abundant. Soon after the fall of the waters of the Orinoco, which begins in February, millions of turtles deposit their eggs among the sand, and the Indians obtain a rich harvest of food. From the eggs they obtain a rich oil, termed mantega, which is preserved in pots. A good deal is sent down the Amazon, fully to the value of £2000, and several thousand persons are occupied in its preparation.

The eggs are not very large, about the size of a bantam's egg. The stratum of eggs in the sand is ascertained by a pole thrust in, the mean depth being about 3 feet, and the harvest of eggs is estimated like the produce of a well cultivated acre. An area accurately measured, of

120 feet long and 30 wide, having been known to yield 100 jars of oil. The eggs when collected are thrown into long troughs of water, and being broken and stirred with shovels, they remain exposed to the sun, till the yolk, the oily part, which swims on the surface, has time to inspissate; as fast as this oily part is collected on the surface of the water, it is taken off and boiled over a quick fire. This animal oil or tortoise grease, when prepared, is limpid, inodorous and scarcely yellow. It is used not merely to burn in lamps, but in dressing victuals, to which it imparts no disagreeable taste. It is not easy, however, to produce oil of turtle's eggs quite pure. It has generally a putrid smell, owing to the mixture of addled eggs. The total gathering of the three shores between the junction of the Orinoco with the Apure, where the collection of eggs is annually made, is 5000 jars; and it takes about 5000 eggs to furnish one jar of oil.

In some of the bays of the Bonin Islands, green turtle are so numerous that they quite hide the colour of the shore, and many are from 3 to 4 cwt. each.

The land tortoise is largely used for food, both fresh and salted in the Gallipagos Archipelago, and other islands of the Pacific, and a beautifully clear oil is prepared from the fat. They are eaten in Australia by the aborigines, and in Russia, the shores of the Mediterranean, and some parts of Germany are fattened for the table, and are esteemed a great delicacy.

In view of the use to which these turtle eggs are applied, could no commercial value be given to the large numbers of sea-fowl's eggs which are met with on our own rocky coasts, and distant islands and shores. Is there no way of preserving them for food, or applying them to the purposes of the arts. Spoiled and broken eggs find a ready sale here among bookbinders as a glaze. From an island a few miles from the Cape of Good Hope, about 250,000 eggs of the penguin and gull are collected every fortnight, and sold at Cape Town at a halfpenny each.

Excellent saddles, and beautiful boots and shoes have been made out of alligator skins, as pliant as calf skin, and beautifully mottled, like tortoiseshell. The skin of the porpoise has also been tanned in the cities of the St. Lawrence—and the hide of the walrus has been turned to profitable account by our North American neighbours.

The sponge trade is largely on the increase, and affords profitable employment to the fishermen of the Bahama islands, the shipments, being to the amount of 12,000*l.* to 14,000*l.* in value per annum. It is only, however, the coarse descriptions of sponge that are obtained on the Bahama banks, and abundantly all about the coast of Florida. Sponge to the value of 5,000*l.* was gathered last year in the neighbourhood of Key West, Florida. The finest kinds come from the Mediterranean; but sponge could be procured in all the warm latitudes.

One person alone pays £15,000 a year for lobsters from Norway and Sweden; and from Bergen as many as 260,000 pairs have been exported in one year; and while we go thus far afield for this highly-prized shell-fish, they can be obtained in large quantities round the shores of our own island. From Skye and the Western Islands hundreds of tea-chests full are sent by rail to Liverpool, London, and the large manufacturing towns; and a report on the Irish fisheries tells us that 20,000 or 30,000 a week might easily be captured on about twenty miles of the coast of Clifden, Buffon Island, and Bunown. On the coasts of New Brunswick carts are frequently driven down to the beaches at low-water, and filled with lobsters left by the tide in the shallow pools, and they are used to manure the potato fields. Within a few years establishments have been founded to preserve the best parts of the lobsters for export in tin cases, of which 12,000 to 13,000 cases, and one or two tons of preserved salmon, are shipped by one establishment. The finest lobsters, caught in hoop nets, can be procured there at 2s. the hundred. Another firm, in the Bay of Chaleur purchases from the settlers the white part of the lobsters, free from shell, and salts them, and packs them in barrels, in plain pickle, for Quebec—sending off thus from 2,000 to 3,000 pounds at a time.

It is stated that 40,000 fishing vessels arrive annually from different parts of the coast of China, and remain three months, fishing off the island of Chusan. The "yellow mandarin" fishery is analogous to the herring fishery of Great Britain or of Holland. About £60,000 is invested in this trade. Ice boats attend the fishing vessels off Chusan, and as soon as the fish are caught they are packed in ice, and sent to the most distant parts of the empire.

The white fish of the bays and lakes of Canada is said to be the finest fish in the world. The flavour of it is incomparable, especially when split open and fried with eggs and crumbs of bread. They weigh on the average about two pounds each when cleaned, 100 of them filling a good-sized barrel. Those caught in Lake Huron are more highly-prized than any others. A huge maskalonge, so ravenous is its propensities, is often caught from the stern of a steamer in full sail, by throwing out a strong line with a small tin fish attached.

The quantity of fish cured in Upper Canada is about 100,000 barrels, worth about twenty shillings per barrel. Including the home consumption in both provinces the Canadian waters yield nearly £150,000 worth of fish every year, and might be made to yield tenfold that amount.

A marked peculiarity of most of the lake fish is the quantity of *fat*, resembling that of quadrupeds, which they contain, entirely different from the salt-water fish; while their flavour differs from that of the latter, it is much more delicate and whiter than that of river fish.

The siskawit, a fish of Lake Superior, is reported to be the fattest fish that swims either in fresh or salt water. The fishermen say that one of these fish, when hung by the tail in the hot sun of a summer's day, will melt and entirely disappear except the bones. In packing about fifty barrels last season at Isle Royale, one of the fishermen made two and a half barrels of oil from the heads and leaf fat alone, without the least injury to the marketableness of the fish. Besides this leaf fat the fat or oil is disseminated in a layer of fat and a layer of lean throughout the fish. They are too fat to be eaten fresh, and are put up for market like the Lake white fish and Mackinac trout—celebrated American delicacies.

The salmon is found in no other waters in such vast multitudes as are met in the rivers emptying into the Pacific. In California and Oregon the rivers are alive with them, and the fish ascend the rivers at all seasons, in numbers beyond all computation. The great number taken by the fishermen are but a drop from the bucket. Higher up on the coast side tribes of Indians use no other food. In the course of a few years salmon-fishing will extend to all the prominent rivers in that quarter of America. Catching and curing salmon will then have become a systematised business; the fish consumption will then have extended itself more generally over the State of California, and have probably become, in the meantime, an important article of export.

In the Sacramento river, California, about 2,000 to 3,000 salmon are taken daily, averaging 17lbs. weight each, and the fish sold at 1d. a pound. Large numbers are salted down daily, several firms and individuals being extensively engaged in this branch of the trade, and the fish business employs about 1,000 men in the Sacramento river alone.

In the New Brunswick rivers, on the Atlantic side, the old plan of salting the salmon in barrels is now nearly abandoned, and the more profitable one pursued of putting them up fresh in tins. This is a most important and valuable branch of trade, and is becoming more so every year. On the Labrador coast, about Sandwich and Esquimaux bays, the great salmon fisheries of the north commence. It is, observes Captain Cochrane, in a recent report to the Newfoundland Government, much to be regretted that so little is known to the public generally of the available rivers and bays about those parts. I may mention, as a curious fact, that in 1852 a large establishment was made in an excellent harbour, where not a house had stood for near half a century, that is now catching 1,200 tierces of salmon, with a probable chance of doubling that amount. Such resources, it is desirable, should be found out and developed.

Myriads of sardines abound along the whole southern coast of California. The Bay of Monterey has especially become famous for its abundance of this small but valuable fish. It is a matter of surprise that the taking and preparation of this fish, which enters so largely into the commerce of the world, has never been attended to as a source of revenue and profit there, to supply the home demand, instead of importing, as is now done, some 8,000 or 9,000 cases.

Sea-shells form a considerable item of commerce, and might be much more introduced. Cowries for the purposes of money, are imported to the extent of, frequently, 25,000 cwt. in the year, to be diffused over the coasts of Africa and India, where they pass current. The shells suited for cameo cutting in this country and France are used to the number of several hundred thousand, which are worth £40,000 to £50,000. Mother-of-pearl shells to the extent of millions could be imported from the South Sea Islands and China Seas, and are always exceedingly valuable. I entered at some length into the importance of the trade in shells in a paper in the *Merchant's Magazine*, in February last.

The French and ourselves are large consumers of isinglass, the average imports into each country being about 50 tons; but the supply is not equal to the demand, and hence the price keeps high. Our principal supplies have come recently from Brazil. Isinglass was long regarded as obtainable only from the swimming-bladder of species of the sturgeon in Russia, but the hake, cod, and many other fish of India and America now furnish it, so that isinglass could be obtained at a much more reasonable rate than hitherto, and particularly from the sturgeon in North America, where the swimming bladder is absolutely wasted altogether.

Mr. Borden, of Texas, received a Council Medal at the Great Exhibition in 1851 for his meat biscuit, of which I have since heard little in a commercial point of view, although its value for supplying the troops of the allies in the Crimea would now be inestimable. There were very many species of concentrated and portable nutritious food, such as Du Liscoet's biscuit beef for soup, Warriner's osma zone, and others, which deserved more enduring attention than the evanescent notice which they appear to have received. The preservation of vegetable food is at many times of great importance.

The waste of the fisheries might be made a very profitable source of revenue as manure, and the subject has frequently occupied attention without leading to any definite result. About two-thirds, or one-half, of the cod and other fish caught in the Gulf of St. Lawrence, and on the banks of Newfoundland, is thrown away as waste or offal. The quantity of animal matter wasted from the seal fishery is estimated at nearly 100,000 tons, and from the Newfoundland cod-fishery at about 120,000 tons. A Mr. Pettitt has patented a plan by which this refuse might be converted to a portable manure of considerable value. He subjects the pulpy mass to the action of sulphuric acid, and afterwards dries it by dessication, or absorbs the fluidity by admixture with peat, charcoal, or other drying material. The French scientific agriculturalists have taken great pains to make fish manure available, by subjecting the refuse, or waste fish, to the action of steam, drawing off the oil and water, and after drying the compact mass, pulverizing it in mills.

The dry bones of seals, whales, &c., if burnt, to facilitate transport, would always be valuable as manure.

The carcases of beasts slaughtered for their skins, and then exposed to the action of steam, to extract the fat, have been occasionally exported as manure from South America.

When we see the value of the dead carcases of horses, and the numerous purposes to which offal is applied—that even rats are turned to advantage for their skins—we should not despise the most insignificant and apparently trivial things. The contractor for the dead carcases and offal of the city of New York is making a large fortune by the uses to which he turns all this apparent refuse of about 500 dead horses and cows, and two or three hundred cats and dogs per month. He converts all these into Prussian blue, glue, bone dust, and manure. The local trade in hair and feathers, again, in New York, is estimated at £600,000 per annum.

In the River Plate, cattle furnish a large amount of the staples of commerce, hides, horns, jerked beef, tallow, bones, and animal guano. The meat is cut into long thin strips, dragged through a vat of brine to cleanse it, salted for a day or two, and hung on poles in the sun to dry. When dried it is stacked up in regular hay-stack form, where it remains until exported as jerked beef. It is shipped principally to Cuba and Brazil as food for the slaves.

Mares by thousands are also killed at these butchering establishments, the skins are preserved, and the carcase is steamed to produce grease or fat. The very city of Buenos Ayres is lit with gas made from mare's grease. This whole region has been well described as one horse and hoof fair. Refined oil is now obtained from bones.

A large quantity of glue might be made abroad from the parings and cutting of hides, and all animal skins, the tendons and other offal of slaughter-houses, yielding an inferior quality. About fifteen tons of gelatine are imported annually from France.

Immense herds of buffaloes range the vast American prairies, extending from the Mississipi to the Missouri. Droves of them, reaching as far as the eye could see, and numbering several hundred thousands, were met with recently by the surveyors of the Pacific railroad. About 400,000 are supposed to be slaughtered annually. 150,000 buffalo robes are received at various fur stations, and 100,000 buffaloes are supposed to be killed by the Indians merely to obtain their skins for tent coverings. Of the remaining 150,000 some are diverted to the use of blankets, saddles, skin boots, &c. The flesh is entirely wasted. One steamer brought down to St. Louis recently from the Kansas river 4,000 packs of buffalo robes, valued at 32,000*l.* The average price of buffalo robes in the Western territories is about four dollars wholesale, and seven or eight retail. Very large black robes bring as high as ten dollars. From 800,000 to 1,000,000 buffaloes must die annually in India and the East, from the number of horns and tips brought to England from thence. From South America we import a million horns annually. From 18,000 to 20,000 elephants are killed annually to furnish the ivory used by the Sheffield manufacturers.

Biltong is a name given in the Cape Colony to strips of raw meat cut out of the hams, sirloins, or fleshy parts of cattle, antelopes, &c., sprinkled with salt, and dried in the sun.

At Galatz, on the Danube, the best kind of tallow is called chervice, and for the Turkish market it is worth ten per cent. more than ordinary tallow. It is the clear fat of the carcase and marrow boiled, and is much used at Constantinople for culinary purposes.

If we have glanced at the commercial products of the earth and the seas we should not omit altogether the *tenants of the air*, which, although, less important, are yet not undeserving of a passing notice. The trade and commerce in poultry and eggs is a considerable one, and I have elsewhere in a paper on the subject drawn attention to its growing importance.* From France we import annually about 110 millions of eggs, and 11,000 head of poultry, besides dressed feathers to the value of

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* Lawson's Merchant's Magazine, Vol. 2, p. 855.

£6720. About 5000 bags of feathers are annually brought down the Mississipipi to New Orleans. A large trade is carried on in eggs between Canada and the United States, about 12,000 barrels being annually sent to one American town, Oswego. Game of various kinds, ortolans, quails, quills, ostrich feathers, swan down, eider down, feathers, flowers, and birds of Paradise, are other products of the feathered tribe. From Greenland 3,000 lbs. of eider-down are shipped annually, besides quantities from other quarters. In the East about four million swallows' nests, made of a glutinous sea-weed, and used for soups, are collected in Java and imported to China, where the best kinds fetch two dollars the ounce.

The passenger pigeon of America is a very large and well-flavoured variety, which migrates in millions, and seven tons of them have frequently been carried into the New York market by the Erie railroad in one day. In their breeding places herds of hogs are fed on the young pigeons, or squabs as they are termed, which are also melted down as a substitute for butter or lard. The felling of a single tree often produces 200 squabs, nearly as large as the old ones, and almost one mass of fat. When the flocks of full-grown pigeons enter a district, nets and guns are in requisition, and waggon loads of pigeons are poured into the towns, and sold at 6d. to 2s. the dozen. Why could not this large pigeon, whose migratory habits are principally caused by search for food, be introduced into this country, as a tame variety; or, by crossing with our native breeds, enlarge the size; or, in the same way as fresh mutton was sent from Australia, be shipped in casks, potted in their own fat, to supply us with cheap pigeon pies.

And the same with a cross with the large Texan rabbit, or the wild American turkey, the latter being far superior in size and appearance to its degenerate descendant—the tame turkey—being sometimes four feet in length, and five feet from wing to wing.

The canvas-back ducks of America are there boasted of exceedingly as a delicacy; yet, although a great variety of useless waterfowl have been introduced merely as ornaments for the ponds and streams of our gentry, no attempt has been made to bring this kind to our farm-yards and tables; and even if it was found impossible to have the pure breed, a cross with our own might be effected.

The albatross is easily caught in moderate weather by any kind of hook floated with a bait. They not only extend far north into the Pacific, but are found on the southern borders of the Indian Ocean, and occasionally far to the eastward. They have a large quantity of remarkably fine and soft down upon their bodies, nearly an inch in thickness. The prepared skins would, therefore, be very valuable, and, in connection with a sealing voyage, might, perhaps, be well worthy of attention. The sea-fowl generally furnish large quantities of feathers, which are seldom collected.

Great numbers of the guacharo (*Steatornis caripensis*), a curious nocturnal bird, about the size of a common fowl, inhabiting immense caves in some parts of South America, are slaughtered by the Indians for the great quantity of oil which is rendered by the fat of its body. The fat is melted in clay pots over a fire of brushwood. The butter or oil thus obtained is half liquid, transparent, inodorous, and so pure that it will keep a year without turning rancid.

The products of the insect tribe are well worthy of more extended attention—silk, especially, has been much neglected, but more attention is now being directed to it in India, in Malta, and in Natal. Cochineal, lac, cantharides, galls, honey, and beeswax are all articles of commercial importance. The beeswax of Ceylon, unlike that of Europe, contains no elements of acidity. Many of our colonies could furnish a large amount of honey and wax. Canada produces a fair supply, and a great deal is shipped from Cuba. It has been estimated that Scotland could maintain as many bees as would on an average produce eighty million quarts of honey and one million pounds of wax. Were this quantity tripled for England and Ireland, the produce of the empire would be two hundred and forty million quarts of honey, and three million pounds of wax annually, yielding a return of about £3,250 sterling.

The mineralogical resources of our foreign possessions is a department of science replete with interest and value, and glad am I to find so much investigation taking place in geological surveys, which are calculated to lead to valuable results and discoveries. Already we see that great attention has been paid to this subject in Jamaica and some of the other West India islands, in Natal and the Cape Colony, in India and the East, and in Australia. Valuable lodes of copper and lead, iron stone, lime stone, lithographic stone, slate, coal, &c., have thus been opened up to commerce. The importance of coal discoveries at distant stations, whether for domestic use or manufacturing purposes, cannot be overrated, and is more especially important now, when steam communication is fast taking the place of sailing vessels in coasting traffic, on the shores and rivers of India, Australia, California, and America.

Time will not permit me even to allude to the *chemical and pharmaceutical products*, many of which are entirely of recent origin, and some of which swell our commerce to an immense extent. We find uses for some 60,000 tons of pearl and potashes per annum. Montreal ships 30,000 or 40,000 barrels yearly, and New York nearly as much.

I have thus glanced cursorily over some few matters and products which appeared to me deserving of greater attention. The enumeration is necessarily circumscribed, and the descriptions brief and limited. Happy, however, shall I be if I have been able to point attention to any which may seem hopeful and promising to those who are in search of fresh supplies of a particular commodity. This Society, in its century of operations, has accomplished great good, not only by the discussions and investigations originated by its own members, the useful information it has diffused, the premiums it has annually offered and awarded for new products, or supplies of old staples from new fields; but also by the spirit of investigation and inquiry it has stimulated, and by the example of industrial exhibitions which it has originated, and which are spreading far and wide, not only throughout our colonies, but over foreign countries and distant possessions, where emulation is awakened, a kindly spirit of rivalry promoted, and the principle of the advantages of reciprocal trade, and scientific ideas and improvements, is becoming more thoroughly understood.

The second paper read was

ON THE INFLUENCE OF CLIMATE ON PRODUCTION.

By A. G. Findlay, F R.G.S.

I would suggest one view of the subject which has been discussed this evening, based upon natural causes, which, in the consideration of raw products, is not always kept prominent—that their *nature* is dependent on the physical and climatological conditions of their locality.

Viewed in this way we shall see that in certain corresponding portions of the globe there will be a similarity of animal and vegetable products resulting from these physical relations; and supposing that it be desirable or necessary to seek for an increased supply of any particular *class* of products, it may certainly be found in other localities, perhaps untried, corresponding to those from which it may have been previously derived.

It would be trite and unnecessary to go into the question of climatology, the phenomena of the evaporating trade winds causing the climates on the eastern sides of tropical countries to be very much more humid than the western, from their moisture being all deposited in their transit—that under the tropics there are two lines of rainless deserts around the globe—and that within the tropics, between lats. 10° and 20°, is a region of surpassing fertility on each side of the equator, while on the equator there is a constant state of humidity and extreme heat. These facts will present themselves to most present. I would wish to apply these observations to the subject before us, vegetable and animal life being only those influenced by these causes.

To agriculture any artificial fertiliser is of the utmost importance. The *guano* products have been of enormous advantage. These deposits owe their excellence pre-eminently to the facts above quoted. Guano, by which is meant of good quality, has long been found in three districts which it will be seen lie exactly in the same geographical and physical relation; on the west side of the continent of South America, within the tropic, and near the tropic on the south-west coast of Africa, &c., and Sharks' bay, West Australia. All these deposits free from any deterioration from rain; in the first instance, they are protected therefrom by the Andes to the eastward, which, by intercepting one-half the atmospheric circulation, prevents the rain reaching the west coast. It may be confidently assumed that guano will not be found in any other part of the world. I would draw attention to a district which I believe is as yet almost commercially untried which might bring great benefit to agriculture and chemistry by the importation of native salts existing in enormous quantities. I refer to the Desert of Acatama, near the Pacific coast, between Chile and Bolivia. The existence of soda, either in the form of nitrate, carbonate, or sulphate in addition to the common muriate, on the surface of this vast arid tract is a singular fact, owing to the absence of rain. The enormous wealth of the adjacent silver and other mines developed since 1832, has eclipsed the value of these otherwise useful products. Numerous other mineral productions abound here, which perhaps the completion of the Panama railroad, expected at the present moment may bring more perfectly within the range of British enterprise.

There is a zone on either side of the Equator, or about latitude 20° which is singularly rich in the production of gum-bearing plants. Thus the French colonies of the Senegal have engrossed those regions which were formerly the great mart for the supply of British demand. Increase in the supply of these gums, so essential to the silk and many other manufactures is a great desideratum, and I would direct attention to those regions of Southern Africa, discovered and traversed by Mr. Galton, the Ovampo, and the northern portions of Damara Lands, and the regions just travelled over by Dr. Livingston, the outlet of which, it seems probable will be the noble but hitherto unexplored river Congo. A great portion of the trees and shrubs here produce gum, and this of course in great variety, among which many new species may exist. The region is in exact correspondence to the gum regions of N.W. Africa near the Senegal. The great difficulties in establishing this trade, and any other which beyond doubt will arise here, will be the formation of a currency, cattle being at present the chief means of barter, a mode which excludes small quantities. If a desire for European manufactured goods can be judiciously introduced, it will develope the immense resources of this hitherto unknown region.

Fibre and its production have been so amply discussed of late, that nothing can be added. One remark will suffice. The best cotton is grown on the eastern side of the continents, and at that part where the great tropical currents commence to flow in an opposite direction. The Sea Islands of the United States, the eastern provinces of Brazil, and the N.E. provinces of the Cape Colony are examples of this. The great field for future production is the N.E. coast of Australia, which lies in an analogous geographical and climatological position to these.

Oil-producing plants flourish in the equatorial regions, and no reasonable doubts can be entertained that the commerce is only limited by the stimulus which can be given to native labour by the inducement of European goods. The personal requirements are so few in these regions where food is so abundant, and raiment unnecessary, that there is a corresponding difficulty in acquiring what is produced by native labour—that which can only be employed. One among many easily-cultivated plants may be adduced—the *Arachis hypogea*, the African ground-nut. Large quantities of it are brought down the Gambia and Senegal, chiefly by French vessels, for the production of an excellent soap-making oil. The whole of the coast of Africa, from the parts named to beyond the Bight of Biaffra, would produce incalculable quantities of this useful vegetable. The country between the Bights and Loango may be a peculiarly advantageous field for this and similar commerce; a fact of which the French have recently availed themselves in the new establishment on the Gaboon River.

The capabilities of this portion of the world are almost dormant. The beautiful islands of the Bights of Africa, rich in countless products and fertility, are unknown to European commerce. St. Thomas, one of these, was the chief colonial possession of Portugal prior to the great advance of Brazil as a European colony,—now it does not contain a single white inhabitant. Fernando Po, another island of exuberant fertility, does not afford a single article of export. Yet all these parts not only would afford very many *new*, but almost any quantity of known articles of the raw produce of the tropics.

Many spices have been almost exclusively drawn from the Eastern Archipelago; it will be seen that these African islands lie in a similar physical position, and would add to the catalogue and quantities of many very valuable products of this nature. One great region for this class of products is the countries of the Somali and Hadramaut, at the eastern part of Africa, and South Arabia,—the latitude of the celebrated Philippines. In similar south latitudes there are archipelagoes, of the nature and extent of which, geographically, we are now only becoming acquainted: I allude to the islands of the Western Pacific, which are now beginning to attract attention.

The natural forests of many of the untried parts of the world would afford dye-woods and timber of every variety, in sufficient quantities to supersede those now in use; as for example,—the vast basins of the Amazon and Orinoco, a world in itself entirely unknown to the white man, except for its exuberant fertility, and its unexampled facilities for water conveyance.

This enumeration might be swelled into a long and tedious catalogue of unused resources, which the most moderate acquaintance with physical geography will determine, are at present quite ready for the hand of man to gather, when the changes of taste, or the insufficiency of existing supplies, shall render their acquisition profitable or necessary.

Again reverting to our first proposition—that certain classes of raw products will be found in particular localities, it is by no means intended to assert that this class *alone* will be found as a staple produce; nature seems to demand a rotation of products, and perhaps it is to this cause that the migrations of commerce, singular in their aspect, have arisen. The producing powers of a country have declined from the fact of but *one* article, in lieu of many, being cultivated.

The countries we have alluded to, being inter-tropical, are not adapted for white labour, and therefore commerce becomes an ethnographical question—one in which the requirements, natural or artificial, of their inhabitants, becomes the primary point. To draw from these countries the produce, dependant even upon slight labour, will require the inducement of European goods in barter, as has been before stated, and therefore the question of the foundation of new commerce will begin in this direction.

DISCUSSION.

Professor Owen said he rose with great pleasure to express the gratification with which he had listened to the papers which had just been read, and also to express his high admiration at the manner in which Mr. Simmonds had compressed into so small a compass the results of so extensive a field of inquiry and observation. He entirely concurred with him that mankind had at present availed itself of a very small proportion only of the benefits to be derived from the teeming fields of organic nature. It was true that that proportion afforded them almost everything they were in want of, either for the necessities, the comforts, or the luxuries of life; but that was only an evidence of the incalculable richness of the gifts of the Great Creator of organic nature. It was only, indeed, when they found from some circumstance, either obscure and unaccountable, like that which appeared to be annihilating the potato root in many countries, or from some changes in our political relations which threatened to cut off the supplies of some of those products, that they began to exercise a little ingenuity and thought, and became stimulated to look further into the rich field of raw materials. With regard to the potato root, for example, he supposed if any one had been acquainted with that root only in its native state, as seen growing scantily in the valleys of Mexico and South America, no ingenuity would have foreseen that it was a source from whence so immense a quantity of nutritious food could be derived, and it was one of the most marvellous circumstances in the development of that plant for human purposes to the extent it had been, when they considered that a poisonous nature was associated with its nutritious nature, but that human culture had diminished the first and increased the quantity of the latter. Perhaps the singular decline of that plant might be intended as a sort of rebuke to that spirit of contentment with what we have, and a stimulus to direct attention to some other specimens of tuberous plants to which the talented author of the paper had that evening called their attention. He entirely concurred with him, that there were many plants as little promising, whilst there were some far more promising, than was the potato when first discovered, which would amply repay the care, labour, skill, and attention of mankind. With respect to another raw material to which the author of the paper had referred,—isinglass, for example —he was much struck when fulfilling the duties of Chairman of the Jury on Raw Materials from the Animal Kingdom at the Great Exhibition in 1851, to find that no specimens of isinglass were exhibited in the Canadian department. The finest and best specimens of that commodity were exhibited in the Russian department. Isinglass of an inferior description was seen in the Indian department, and amongst the produce of South America and the West Indies. The property of isinglass which made it most valuable for the refinement of fermented vinous liquors, was dependent upon the peculiar organisation of the fibre of the air-bladder, and was not connected with its chemical nature. The air-bladder of the sturgeon in particular contained that pure gelatinous material in the greatest quantity, and it was that peculiar characteristic and complex fibre which gave the material the power of catching the feculent matters, and performing all the offices required in the management of fermented vinous liquors. There were unquestionably other fishes which afforded that form of gelatine. Many such were to be found in the Ganges and the Indus, and in the fresh waters of the immense rivers of North America, but in none that he was acquainted with was that peculiar form of isinglass so fully developed as in the sturgeon species. Looking at the geographical relations with the organic products, he should have expected to find the sturgeon in the North American rivers, and, on inquiring of the chief of the Canadian department, he found that such was the fact, and that they were brought by the steamers to Quebec for food, but that the air-bladders were all thrown away. There was a source of wealth which he thought they ought to welcome. He believed the Canadian markets were capable of affording very large supplies of isinglass, and he had taken pains to arouse them upon the subject, and he had put the representatives of that department in communication with some of the largest isinglass merchants in London, and he hoped by this time attention had been awakened to the matter; for he was sure that when a cargo of isinglass from the air-bladder of the sturgeon arrived from our colonies in North America, it would meet with a pecuniary reward, which would be the best stimulus they could have. With reference to the introduction of animals as food—for instance, the delicacy of the canvas-back duck, that had called his mind to another fact, which was at present exciting a great deal of attention, and some degree of anxiety, too, in England. He referred to the development, which they all regretted, of a peculiar aquatic plant, which appeared to defy all mechanical modes of extirpation, and was spreading in our rivers and streams with fearful rapidity. Nature, however, had ordained a means of keeping a balance in this respect, that was, in the aquatic birds which fed upon those subaqueous plants. For that purpose he would recommend the more extensive introduction of the ordinary tame swan. He believed that beautiful and noble bird would thrive, breed, and fatten, and multiply to a large extent, helping in a very great measure to keep down these newly-introduced orders of aquatic plants. In fact, he had heard instances of the benefits in that respect arising from the operations of the swan; and, moreover, the delicate luxury of the young swan, which was introduced with all the epicurean honors at the civic feasts at Norwich, would be no longer confined to that body, but would become a readily obtainable delicacy for the table. But seeing that the canvas-back duck owed its delicate flavour to the proportion of aquatic plants on which it fed, the best chance they had of procuring it in the high perfection for which it was celebrated in North America, would be to try the experiment with those birds in their own rivers and streams, and such as were curious in those matters he would advise to put themselves in communication with his friend, Mr. Mitchell, the secretary of the Zoological Society, who he was sure would give them all the benefit which his practical experience could afford. There were other points of a more general nature which this paper suggested. It was the fact that there are vast tracts of land in our colonies which are as yet wholly uncultivated, but which were placed by Nature under circumstances to produce the most valuable vegetable products. He would only refer to the western coast of India, leading to the extremity of the cape of land near to which is the island of Ceylon. Let them consider the mountain range that extended along that coast. How extremely small a proportion of that part of India was as yet under any kind of profitable cultivation, and yet its valleys abounded with Coolie labourers, and it was from thence they were exported to Ceylon to work in the coffee plantations. This brought to his mind the remark of that talented and sagacious statesman, Lord John Russell, which he made when some crude proposals were broached as to the supply of a substitute for slave labour—"Carry," said his lordship, "the plantation to the Coolie, and not the Coolie to the plantation."

Mr. Varley said he could not go to the length which the learned professor had done in totally condemning the aquatic plant referred to, inasmuch, as from experiments he had made, he found it to act as an excellent filter and purifier of water. He felt bound to state that it possessed some redeeming qualities.

Mr. G. F. Wilson should be very glad if he could add anything to the mass of valuable information which Mr. Simmonds had brought forward. The unused valuable products with which he had some acquaintance were of the class of vegetable oils and tallows. He had made many inquiries respecting them in various parts of the world, and had heard of them as being produced in very great numbers and abundance. The Borneon vegetable tallow, which Mr. Simmonds mentioned, came to this country in considerable quantity when its value here was a third less than it was at present; the reduction in the supply was probably owing to the increased collection of gutta percha, and the want of work people. The oil of the Argan tree of Morocco, of which he spoke, was a valuable one, even if it could not be obtained profitably from its present country; yet, thanks to the watchful care of Sir William Hooker, the tree would probably soon be naturalised in our own colonies. The profitable obtaining of seeds containing new oils and fats depended, of course, on the cost of collection and transit. In some of the forests of Central and South America, where these products are plentiful, the Indians have to be employed to procure them from a distance of often many days' journey from a station, and they must be paid beforehand. The money was too often spent in drink in the neighbourhood, and the collectors returned, saying that they had made the journey, but could not find any seed. He had a letter in his pocket which, he thought, well pictured the difficulties a collector in these countries had to contend with. His correspondent said—"If a trader wishes to get together a cargo of any product of the country, he must start up one of the rivers with a cargo of goods, which he distributes, as he goes along, to all the Indians who are disposed to work, marking the time of his returning to the same spot to receive payment, at three months, or six months, or perhaps twelve months. When he comes again he perhaps spends two or three months in seeking up his cargo—beating up the Indians at their 'Sitios,' dragging his boat up cataracts, and threading wearisome forest tracts. If, after all this, he succeeds in getting together half the quantity owing to him, he considers his success extraordinary. He must, of course, go the following year to the same place, and without a further advance he will not receive a single stick of what was owing to him. Thus it has happened that many persons who have come up the Rio Negro with a cargo of goods, intending to purchase 'generos' of the country, and return laden with them, have found it necessary to leave their goods and return empty-handed, while in the following year they come again to collect a modicum of their debt, and leave as much more on credit. They have thus no alternative but to go on, year by year, to the end of their days, and never possess a farthing they can call their own—their original cargo having been furnished on credit by some merchant in Para or the Barra." We have heard the same story from other sources. Many new oils were now coming in from India and elsewhere, and would come in in greatly increased quantities, but, owing to the difficulties above mentioned very many others could not be expected for some time to come.

Mr. BENNOCH said he had hardly intended to trouble the meeting with any observations, because he felt himself incompetent to add anything to the interest of the papers which had been read; but as the reading of a good paper frequently led to some suggestions being made, perhaps it was well that those suggestions should be offered, although they might not strictly pertain to the subject matter of the paper itself. On the present occasion, there seemed to be mixed up with the subject a certain amount of public advantage with a feeling of political and patriotic sentiments; and the great consideration was, how they could best overcome the difficulties occasioned to our manufacturers by the cessation of the supplies of European products which they had been accustomed to receive. He had sometimes thought that, on occasions, nature came in and rebuked them for their indulgence and presumption. If they depended upon a particular root or staple, it was sometimes taken from them, and their indulgence was punished; but at the same time it stirred them up in another direction, and compelled them, by attention to the laws of nature, not only to supply the deficiency created, but to produce something for their benefit superior to that which they had lost. Two or three points in the very talented papers that had been read had struck him as being very peculiar, and one especially had excited in him a certain degree, he would say, of annoyance, and that was, the dispersion of the valuable collection of raw products from the Great Exhibition of 1851. He, for one, had expected that it would have been got together and exhibited in some position where the commercial interests of the country might view the various products of the earth without difficulty; but he discovered that they had been distributed throughout the different museums in the country, and would be looked upon as matters of curiosity, and not of utility, which was much to be lamented. He had hoped that this Society would have possessed sufficient influence with the Government to have induced them to have set up in some part of London an exhibition of matters so important to them as a commercial people. They all knew the difficulty there was, in shipping a cargo to a foreign country, to know what they should have back in return for their venture. Their seamen and captains of vessels were not generally personally acquainted with the raw products of the countries they were bound to; but in the event of such an exhibition having been established, the merchant himself could take those men who were to represent him at the antipodes, and show them the description of commodity which he wished them to bring back, and by that means England would be benefited, and the world at large would be advanced in its commercial institutions. They had discovered a hiatus which could only be supplied by such lectures as these, and their necessities became their great instructors. He felt very great diffidence in expressing his sentiments before that enlightened assembly, but he thought that these were points which it was very important to keep before them, when they discovered that by a chemical application to vegetable matters, they could produce tallow equal to that which they got from Russia at one-sixth the cost. That was an important fact, if there had been no other to engage them that evening.

Mr. SIMMONDS, on the part of Mr. Rowbotham, called attention to a stout description of fibre obtained from the kittool or jaggery palm of Ceylon, which he said was in every respect applicable for street-sweeping machinery, and other operations for which bristles had hitherto been used. About 20 tons of that material, he said, had either just arrived, or was shortly expected.

Mr. SHARP said, that in responding to the call of the Chairman, he should limit himself to a few observations on the question of fibrous plants,—not the least important of the various subjects introduced into Mr. Simmonds's able and comprehensive dissertation. It was a subject that had long occupied his anxious and earnest attention, and although reference had been made to numerous plants of the eastern world, he should restrict his remarks to the fibrous plants produced in the West Indies, to which he had more particularly directed his attention. It had afforded him much pleasure to place at the disposal of Mr. Simmonds, for illustration of that part of his subject, various plants received from his correspondent in Jamaica, which lay upon the table. The plantain, among them, was one of the most extensive and prolific growth, and he had not the slightest hesitation in saying that the colonies would produce everything necessary for the requirements of this country, whether for textile purposes, cordage, or paper,—for which latter purpose, especially in the present state of the trade, the fibre was of peculiar value, as producing paper of the finest quality. Referring only to the two colonies of Jamaica and British Guiana, he would declare his conviction that these two colonies alone could furnish fibres to the extent, if needful, of 100,000 tons a year. Was this a trifling consideration? It was well, on a subject of this nature, to examine the field that was open for such a new branch of industry. We have imported from foreign countries within the present century 2,250,000 tons of flax, and 1,500,000 tons of hemp, of the value of 140 millions sterling; of which upwards of 3,000,000 tons, of the value of 116 millions sterling, came from Russia. Our payments to that country for these two commodities, last year, was four millions, part of the eleven millions which we paid her for the produce of her soil, whilst she took of our produce and manufactures only one-tenth of that amount, being less than £1,100,000. "Sir," said Mr. Sharp, "I am an old man; and more than seventy summers having passed over my head, you can readily comprehend that all the events of the French Revolution of the last century, and the wars in which for the succeeding twenty-five years we were engaged, are within my recollection. I well remember, and closely watched the state of affairs in the five years, 1809 to 1813, which succeeded to the promulgation of the celebrated Berlin and Milan decrees, when our continental trade was so much disturbed. I have looked into the value of flax and hemp during that period, and I find that the average price of flax for those five years was £98, and for hemp £82 per ton; the highest prices quoted having been respectively £142 and £118 per ton. I have perfectly in my recollection the extreme earnestness and anxiety with which the Government of that day ransacked the most remote quarters of the globe to find substitutes for the continental produce; and, if I am not much mistaken, the Society of Arts lent their best aid to the accomplishment of that object. It is time that the smuggling of Russian produce into this country through Prussian ports should be put an end to, and that the millions a-year paid to them for flax and hemp should be henceforth paid for the produce of our colonial possessions, which were well able to provide it."

Mr. Trent having made an observation, questioning the applicability of the plantain fibre to all the purposes for which flax and hemp were employed,

Mr. Sharp stated, in explanation, that his remarks were somewhat misconstrued; it was true that he had more particularly referred to the plantain, that tree being of the most extensive and prolific growth, and the specimens being before them on the table, but instead of limiting his remarks to that fibre, he could enumerate twenty or more fibres, of great value, all of them equal, many greatly superior in quality, to either flax or hemp. He repeated that 100,000 tons of them could be provided, and they were proved capable of being converted into various fabrics, as well as being mixed with cotton, silk, and even wool. It had been observed that he had patents for the requisite machinery to prepare these fibres. That was the fact; and arrangements were making for carrying out the question on a large scale; and he was resolved that it should be carried forward with all the energy and earnestness that he could throw into it.

Mr. Stewart said if, through the medium of this Society, or of Mr. Simmonds himself, a greater number of the curative agents he had mentioned could be obtained, he was happy to say, on the part of the Pharmaceutical Society, that the fullest investigation would be made of their medical properties.

The Chairman said it now became his duty to propose that the thanks of that meeting should be given to Mr. Simmonds for his very interesting and valuable paper, and also to Mr. Findlay for the supplemental paper read by Mr. Foster. He could not but express his opinion of the great value of the papers which had been read that evening, and if any subject was a proper one for this Society to take cognizance of, it must be that which had now occupied their attention, at a moment like the present, when every energy of the country was directed towards the finding of substitutes for materials which they had hitherto been accustomed to receive from other countries. If a discussion of this kind was important in the time of peace, how much was its importance enhanced in time of war. We were now more than ever dependent upon our colonies, and it was our duty to encourage the inhabitants of those countries, to supply us with the produce with which nature had so bountifully provided them. He could truly say that he never recollected hearing a paper read into which so much valuable information was compressed, or so many ideas thrown out so appropriately,—so tersely, and so eloquently. He could not agree in the view expressed by Mr. Sharp as to the stopping altogether our supplies of Russian produce. He believed that the increased price which must necessarily be paid for such products, due to the peculiar manner in which they had to be obtained, would afford ample margin for encouragement to our colonies, and to foster their production there. It was, therefore, with very great pleasure that he called upon the meeting to join with him in cordially thanking Mr. Simmonds for his very able paper, and to Mr. Findlay, for the interesting additions he had made to it.

The motion was carried by acclamation.

The Secretary announced that at the meeting of Wednesday, the 6th instant, the following paper would be read:—"Fourth Paper on British Agriculture, with an account of his own operations at Tiptree-hall Farm," by Mr. J. J. Mechi.

THE ROYAL SCOTTISH SOCIETY OF ARTS.

The annual general meeting of the Royal Scottish Society of Arts was held in their hall, 51 George-street, Edinburgh, on Monday, 13th November, 1854, Rev. Professor Kelland, A.M., President, in the chair.

The President opened the session with an address, in which he remarked that the duty of Societies is to make known, to encourage, or to educe. On these three points he entered at some length, remarking, in connection with the first, that from the character of the British Government, exercising so little central supervision, individual enterprise and ingenuity must trust to the practical value of their labours, and not to any State interference. Thus, without the assistance of a Society, the publication of the papers he had already mentioned, would, he thought, be a hazardous speculation. The Society are both publishers and public for the members. It is otherwise on the Continent. The deepest and most crabbed speculations are published in Germany, and find a sale, simply because the State compels public institutions to support them. The State wills that you be scientific, and scientific you are. With us, on the contrary, there is neither coaxing nor constraint; and though the result may be that the lighter bodies sometimes swim to the surface and catch the public eye, yet in the end the heavier bodies generally find their way down the stream too, and reach their landing place. Here it is that a Society like this comes in with its invaluable assistance. In connection with the second head he called attention to the fact that in the history of science and literature eminent names appear in clusters. The discoveries of one man excite the undeveloped talents of others. Intellects strike fire by their mutual friction. Thus it happens that posterity finds it difficult sometimes to assign to each man his exact share in every branch of discovery. Hence the value of societies for circulating information, and bringing minds to bear upon each other and on particular subjects. The native inertness of some minds needs to be overcome by the example of others. The quiet of the country, the absence of disturbing excitements, the freedom from cares, which at first sight seem conducive to a life of study, these are not in practice found to be the concomitants of high eminence. The men who do great things are those who vividly echo in every fibre the sentiment that "society expects every man shall do his duty." These facts (he said) indicate the true object and the value of an association for the encouragement of genius and the reward of exertion. They place its members in the proud position of men who are anxious to see their young brethren raised up to and above their own level—of men who strive to do something towards fulfilling the injunction, "care for others"—an injunction which may be said to be the touchstone of our humanity.

The following Report of the Prize Committee awarding the prizes for Session 1853-54 was then read, and the prizes were delivered by the President to the successful candidates:—1. To Thomas Stevenson, Esq., F.R.S.E., Civil-Engineer, Edinburgh,—for his "Description and Drawings of Dipping and Apparent Lights for Sunk Reefs and Pier-heads of Harbours."—The Society's Gold Medal, value Ten Sovereigns. 2. To James Elliot, Esq., Teacher of Mathematics, Edinburgh,—for his "Mechanical Illustrations of the Planetary Motions," including an Illustration of his Theory of the Stability of Equilibrium of Saturn's Ring.—The Society's Silver Medal, value Ten Sovereigns. 3. To Robert Henry Bow, Esq., C.E., Edinburgh,—for his "Description of New Designs for Iron Roofs of great clear span," &c.; with Drawings.—The Society's Silver Medal, value Ten Sovereigns. 4. To William Swan, Esq., F.R.S.E., Teacher of Mathematics, Edinburgh,—for "Description of his Simple Variation Compass."—The Society's Medal, value Five Sovereigns. 5. To John Scott, Esq., Teacher of Mathematics, Edinburgh,—for his paper "On New properties and applications of Spiral Pumps, &c., with Models and Diagrams."—The Society's Silver Medal, value Five Sovereigns. 6. To Mr. George Mitchell, 101, High-street, Edinburgh,—for his Description of a "Safe Lock, incapable of being opened by any other means than by its own key."—The Society's Medal, value Five Sovereigns. 7. To the Rev. Jame Brodie, Monimail, Fife,—for his "Enquiry into the principles on which the action of Sails and Rudders depends, with Diagrams."—The Society's Silver Medal. 8. To J. T. Thompson, Esq., F.R.G.S., Civil-Engineer and Government Surveyor at Singapore,—for his Description and Drawing of a "Semi-Revolving Light for Lighthouses."—The Society's Silver Medal. 9. To Thomas Rodger, jun., Esq., St. Andrews,—for his Paper "On Collodion Calotype," with Illustrative Specimens.—The Society's Silver Medal. 10. To Alexander Melville Bell, Esq., Teacher of Elocution, Edinburgh,—for his Paper on a "New Principle of Stenography or Shorthand Writing."—The Society's Silver Medal. 11. To Mr. Thomas Steven, Builder, Bonnyrig, Lasswade,—for his Description of a "New Method of Shutting Doors," with a Model.—The Society's Silver Medal. The Committee has also recommended the Model to be purchased for the Museum.

The *Special Thanks* of the Society were given to the following gentlemen, viz.:—1. To Charles Cowan, Esq., M.P.,—for his oral "Sketch of the various changes and improvements which have taken place in the Manufacture of Paper during the last thirty years," with copious Illustrations. 2. To Andrew Fyfe, M.D., F.R.S.E., Professor of Chemistry, King's College, Aberdeen,—for his Communication "On the Chemical Constitution of Coal," and on the question, "Is Torbane Mineral a Coal?" 3. To George Buist, LL.D., Bombay,—for his oral "Account of some of the East India Arts and Manufactures, with Specimens of the Tools and Manufactured Articles." 4. To J. Stonehouse, M.D., London—for the "Description of his Charcoal Respirator, for breathing without danger infectious Atmospheres, with an account of his recent Researches into the Deodorizing and Disinfectant Properties of Charcoal." 5. To George Wilson, M.D., F.R.S.E., Lecturer on Chemistry, Edinburgh,—for his Communication "On the Prevalence of Colour-Blindness, or Chromato-Pseudopsis, and on the Limit which it puts to the Use of Coloured Signals on Railways, at Sea, and elsewhere," and "on the Use of Yellow Eye-Glasses, to assist the Vision of the Colour-Blind by Daylight." Dr. Wilson being engaged in making still further investigations on this subject, a further grant, not exceeding Ten Pounds, to assist in defraying the expense of the prosecution of his important researches, was made to him by the Committee till the investigations be completed. 6. To James Alexander, Esq., Wine Merchant, Edinburgh,—for his "Suggestions for a Simple System of Decimal Notation and Currency after the Portuguese Model." 7. To Mr. John Wilson, 47 Portugal-street, Glasgow,—for his "Description of a Method of preventing Water-cocks from bursting during Frost." The Committee regretted that there had been no communication read during the past Session to which it seemed proper to award the Keith Prize of Thirty Sovereigns.

After the close of the public business, the Society elected its office-bearers for 1854-55, as follows:—President—David Rhind, Esq., F.R.S.E. Vice-Presidents—Edward Sang, Esq.; William A. Smail, Esq , of Overmains, R.N. Secretary, James Todd, Esq., F.R.S.E., W.S., 55, Great King-street. Treasurer, John Scott Moncrief, Esq., Accountant, 20, India-street. Ordinary Councillors,—William Paterson, Esq., C.E.; Thomas Stevenson, Esq., F.R.S.E., C.E.; David Landale, Esq., M.E.; David Stevenson, Esq., F.R.S.E., M.I.C.E.; Robert Ritchie, Esq., C.E. A.I.C.E.; George Wilson, M.D., F.R.S.E.; William A. Roberts, M.D.; Rev. Professor Kelland, M.A.; William Swan, Esq., F.R.S.E.; H. W. Nachot, Ph. D.; James Elliott, Esq.; David Cousin, Esq. Editor of Transactions—George Wilson, M.D., F.R.S.E. Curator of Museum—Mr. Alexander Jamieson. Medalist—Mr. Alexander Kirkwood. Officer and Collector—Mr. Hugh Johnston.

DEATH OF DR. EDWARD STOLLE.

The Berlin correspondent of the *Morning Chronicle*, under date of the 18th inst., announces the sudden death from cholera, at Munich, of this talented technologist. He had remained at Munich to wind up the affairs of the Prussian exhibitors, of whom he was the representative, when he was thus suddenly carried off in the prime of life. It will be remembered that in the year 1852 he received the Gold Medal of the Society, and in the following year the Thanks of the Society, for his papers on the manufacture of Sugar; one of which "On Recent Improvements in the Manufacture of Sugar from the Sugar Cane and Beetroot," was printed in No. 32 of this Journal, Vol. 1, page 389.

Home Correspondence.

OIL OF TAR.

Sir,—In confirmation of what Mr. Bethell advanced at the last meeting in reference *to the preservation of wood from dry rot*, my father and myself have used oil of tar for the last forty years, with the utmost success.

The external application (after scraping off all appearance of dry rot) has never failed in arresting the progress of the disease.

Yours obediently,
DAVID G. LAING,
Member.

2, Villiers-street, Strand.

MEETINGS FOR THE ENSUING WEEK.

Mon.	Entomological, 8.
	Chemical, 8.
Tues.	Horticultural, 3.
	Linnæan, 8.
	Civil Engineers, 8.—Mr. P. W. Barlow, "On the Water-bearing Strata in the neighbourhood of London."
	Pathological, 8.
Wed.	Society of Arts, 8.—Mr. J. J. Mechi, "Fourth Paper on British Agriculture, with the results of his own operations at Tiptree-hall Farm.'
	Pharmaceutical, 8½.
	Ethnological, 8½.
Thurs.	Antiquaries, 8.
	Photographic, 8.—Mr. J. Mayall, "On a New Albumenized Process on Glass."
	Royal, 8½.
Fri.	Astronomical, 8.
	Philological, 8.
Sat.	Royal Botanic, 3¾.
	Medical, 8.

ERRATA.

Page 29, col. 1, line 4, article on the Ventilation of Apartments and Hospitals, for " 50 to 75 cubic centimetres," read " ·50 to ·75 cubic metres. Col. 2, line 7, for " consumes," read "produces." Line 8, for " absorbed," read " generated." Page 30, col. 1, line 45, for "2,550," read "2,250." Line 48, for " 1,982," read " 1,928.

PATENT LAW AMENDMENT ACT, 1852.

APPLICATIONS FOR PATENTS AND PROTECTION ALLOWED.

[*From Gazette, Nov.* 24*th*, 1854.]

Dated 18*th August*, 1854.

1815. F. C. Calvert, Manchester—Iron manufacture.

Dated 22*nd August*, 1854.

1839. T. Lees, Stockport—Lubricating steam-engines.

Dated 7*th October*, 1854.

2153. C. Blunt, Sydenham, and Dr. J. I. W. Watson, Wandsworth—Artificial fuel.

Dated 18*th October*, 1854.

2227. P. A. le Comte de Fontaine Moreau, 4, South-street, Finsbury Preventing collisions on railways. (A communication.)

Dated 21*st October*, 1854.

2244. J. Bernard, Club-chambers, Regent street—Stitching machinery.

Dated 30*th October*, 1854.

2303. G. H. Lilie, De Beauvoir-grove, Kingsland—New material for paper.

Dated 31*st October*, 1854.

2313. C. Vorster, Cologne—Ribbons.

Dated 2*nd November*, 1854.

2327. C. Hargrove, Birmingham—Annealing cast iron.

Dated 3*rd November*, 1854.

2329. H. Walmsley and J. Day, Failsworth, near Manchester—Looms.
2331. C. L. V. Maurice, St. Etienne (Loire)—Carbonising coal.
2333. J. A. Moineau and J. G. Lemasson, Paris—Elastic mattresses and seats.
2335. J. Atherton and J. Kinlock, Preston—Dressing yarns.

Dated 4*th November*, 1854.

2337. G. L. Baxter, Sneinton—Reaping machines.

Dated 6*th November*, 1854.

2341. W. Collis, Barnes—Brewing.
2343. J. Betteley, Liverpool—Iron knees for ships' fastenings.
2345. J. Wallace, jun., Glasgow—Zincographic and lithographic printing.
2347. L. A. Farjon, Paris—Jointing pipes, tubes, &c.

Dated 7*th November*, 1854

2349. J. K. Worts, sen., and J. Worts, jun., Colchester, and J. Page, Langham—Motive power.
2351. C. S. H. Hartog, Islington—Fire arms and cartridges. (A communication.)
2353. A. P. How, Mark lane—Machine for cutting metal rods and bars. (A communication.)
2357. T. Metcalf, High-street, Camden-town—Portable carriages, chairs, &c.
2359. W. Beardmore, Deptford—Railway axle bearings.

Dated 8*th November*, 1854.

2361. G. Davis, Southampton—Taps.
2363. W. Stead, W. Spence, and S. Wood, Bradford—Combing machinery.
2365. J. Gray, Edinburgh—Ventilating hats.
2367. A. McDonald and A. McIntosh, Alexandria, N.B.—Machinery for stretching cloth to be printed on.
2369. A Dalgety, Deptford—Steam boilers.
2370. E. A. Chameroy, Paris—Junction of sheet metal pipes.
2371. G. Bartholemew, Linlithgow—Boots and shoes.

Dated 9*th November*, 1854.

2373. P. Pretsch, Sydenham—Producing copper and plates for printing.
2375. D. Ferrier, Edinburgh—Facilitating reference to books.
2376. F. Palling, Lambeth—Preventing horses running away.
2378. S. Show, Plaistow marshes—Template.
2380. G. T. Bousfield, 8 Sussex-place, Brixton—Machinery for turning prismatic forms. (A communication).
2381. D. Tunks, Accrington—Watches, clocks, chronometers, &c.
2382. H. W. Harman, Northfleet—Windlasses, capstans, crabs, cranes, &c.
2383. F. Smith, York-street, Lambeth—Smoke consuming furnace.
2384. G. Ross, Falcon-square—Articles of caoutchouc. (A communication.)

Dated 10*th November*, 1854.

2385. J. N. Gardener, Keir, near Dunblane—New material for paper and textile fabrics.
2386. W. L. Wigginton, Barnet—Cooking, heating, and ventilating apparatus.
2387. E. Loysel, Paris—Obtaining infusions.
2388. W. Jeakes, Great Russell-street—Heating and ventilating by gas.
2391. S. Ellen, Hackney—Machine for washing clothes.
2392. H. Witthoff, Manchester—Construction of ships.
2394. E. Rimmell, 39 Gerrard-street, Soho—Coating fabrics in substitution of india-rubber. (A communication.)
2395. F. Ransome, Ipswich—Oxides and carbonates of lead or zinc, and carbonate or sulphate of barytes.

Dated 11*th November*, 1854.

2396. W. Kolen, Birmingham—Ornamenting and attaching lables, cards, and window bills.
2397. R. Hesketh, Wimpole-street—Apparatus for supplying fuel to fire-places and stoves.
2398. J. Thomson, Dollar, Clockmaunder—Motive power.
2399. P. A. le Comte de Fontaine Moreau, 4 South-street, Finsbury—Fire-engines. (A communication.)

INVENTIONS WITH COMPLETE SPECIFICATIONS FILED.

2443. G. T. Bousfield, 8 Sussex place, Brixton—Wrought iron carriage and other wheels and pullies—17th November, 1854.
2444. W. Coulson, Fetter-lane—Machinery for morticing, tenoning, and boring—17th November, 1854.

WEEKLY LIST OF PATENTS SEALED.

Sealed November 24*th*, 1854.

1179. Julius Schmoock, Oxford-street—Improvements in the construction of children's and other carriages moved by manual power.
2027. James Robinson, Huddersfield—Improvements in apparatus for generating steam and gas, and consuming smoke.

Sealed November 28*th*, 1854.

1199. Andrieu Ernest Sablons, 4, South-street, Finsbury—Improvements in the construction of trunks, travelling boxes, portmanteaus, and other similar receptacles.
1199. Leopold Wertheimber, Paris—Improvements in apparatus for preventing sea sickness.
1200. Hall Colby, New York—Improvements in instruments for taking altitudes, levels, and angles, which he designates Colby's altimeter or self-adjusting quadrant or sextant.
1209. Julian Bernard, Club-chambers, Regent-street—Improvements in the manufacture or production of boots, shoes, and other protectors for the feet, and in the materials, machinery, or apparatus employed in such manufacture.
1214. John Arrowsmith, Bilston—Improvements in steam boilers.
1216. Walter Westrup, Old Ford—Improvements in the manufacture of wheat into flour.
1225. Edward Orange Wildman Whitehouse—Improvements in effecting telegraphic communications.
1239. John Mason and Louis Christian Keoffler, Rochdale—Improvements in scouring and in washing wool, hairs, and yarns, and in machinery or apparatus for effecting the same.
1247. Napoleon Neron, 119 Rue St. Lazare, Paris—Improvements in muskets, carbines, fowling-pieces, and other fire-arms.
1395. James Pickup, Liverpool—Improvements in steering apparatus.
1327. Louis Ambrose Henry, Metz—Improvements in constructing railroads.
1332. Joseph Valentin Weber, Orchard-street, St. Luke's—Improvements applicable to chronometers and other mechanism requiring a steady spring power.
1363. William Stableford, Bromsgrove—Improvements in railway brakes.
1341. Charles Cowper, 20 Southampton-buildings, Chancery-lane—Improvements in machinery for combing cotton, wool, flax, tow, silk-waste, and other fibrous substances.
1432. John Edwards, Manchester—Improvements in railway chairs.
1463. James Newman, Birmingham—Improvements in the manufacture of metallic rods, rails, and bars.
1686. Joseph Green and William Jackson, Leeds—Improvements in mortising machines.
1825. Nehemiah Brough, Birmingham—Improved dress fastening.
2019. William Henry Dawes, Handsworth—Improvement in the manufacture of iron.
2025. William Gee, Birmingham—Improvements in the manufacture of braces used for boring, driving screws, and other such like purposes.
2053. Samuel Elliott Hoskins, M.D., F.R.S., Guernsey—Improvement in the manufacture of paper.
2126. Thomas Cooper, Isle of Wight—Improvement in the manufacture and in the mode of joining earthenware pipes.

WEEKLY LIST OF DESIGNS FOR ARTICLES OF UTILITY REGISTERED.

Date of Registration.	No. in the Register.	Title.	Proprietors' Names.	Address
Nov. 27.	3662	Chaff-cutting Engine Frame	Smith & Ashby	Stamford, Lincolnshire.
	3663	The Alma Chess and Draught Board, Case, and Instructions..................	James Grove	11, Icknield-st. West, Birmingham.
	3664	Settings for Centres of Buttons and similar Dress Ornaments	Twigg & Silvester...............	Powell-street, Birmingham.